REAL ESTATE ASSESSMENT & DEVELOPMENT PLAN

FOR

THE PROPERTY BOUNDED
BY
8TH, 9TH, GRACE AND BROAD STREETS
IN THE
CITY OF RICHMOND, VIRGINIA

APPENDICES

FOR THE

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES

VIRGINIA DEPARTMENT OF GENERAL SERVICES

July 12, 2005

Hillier ARCHITECTURE

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Photo A.1: Murphy Hotel in 1919.

MURPHY'S HOTEL TIMELINE

1848 -John Murphy immigrated to the US from Ireland at the age of 6. [2]

1862 -John Murphy joined the Confederate Army at the age of 20. [1]

-Fought for the Confederacy under Stonewall Jackson. [2]

-After the war, was released from prison in Ohio, moved out west and got a job with a railroad Co. [2]

ca 1868 -Murphy moved back to Richmond, opened up oyster shack at 8th & Broad Sts. [2]

1872 - Colonel John Murphy started the Murphy Hotel with a few rooms above the oyster bar. [1]

1886 -Two-story frame oyster shack structure torn down and replaced with first brick incarnation of Murphy Hotel. [1]

1899 - William Miller, an African-American waiter at the Murphy Hotel, threw a pot of hot coffee into the face of former world heavyweight champion John L. Sullivan after having his life threatened by the boxer. Miller was sent over $3,000 by admirers, and became a local hero. [3]

1901 - Murphy's Hotel was the place for "legislators, lobbyists and citizens" to gather and debate issues concerning the 1901 General Assembly session; most importantly, whom to appoint to the State Supreme Court and modifications to the state constitution. [4]

-The Richmond Dispatch reported that the Murphy Hotel was "…the livest place in Richmond after supper." [4]

1902 - John Murphy bought the corner lot across 8th Street and spent $51,000 on annex. [1]

1907 -Bought block of 8h Street between Broad and Grace Streets and built another annex. Spent $685,000 on new hotel bldg. [1]

1913 - Brick Building at 8th & Broad was demolished. and the present Murphy's hotel bldg erected. [2]

- John Murphy hired John Kevan Peebles to design the 11-story, H-shaped Murphy's Hotel. [10]

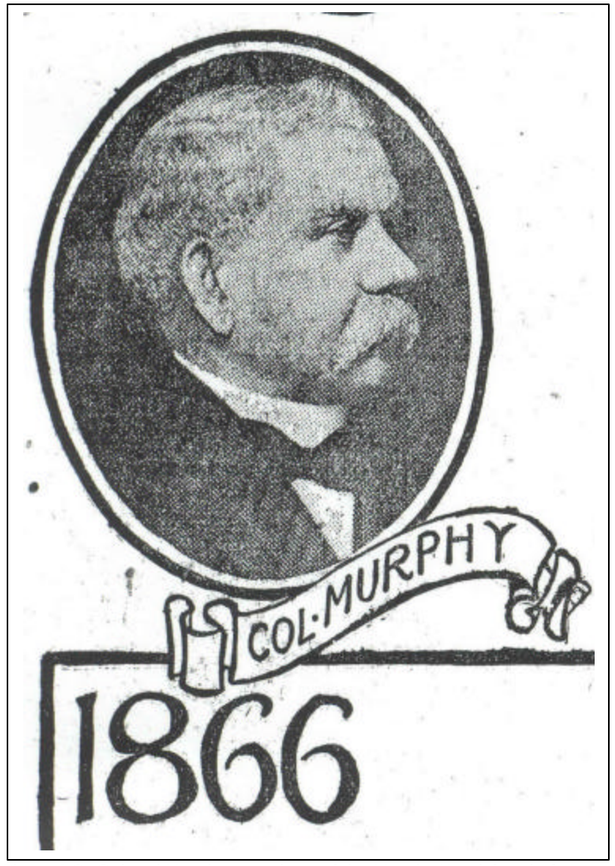

Photo A.2: Colonel Murphy, proprietor of the Murphy Hotel, fought for the Confederacy under Stonewall Jackson.

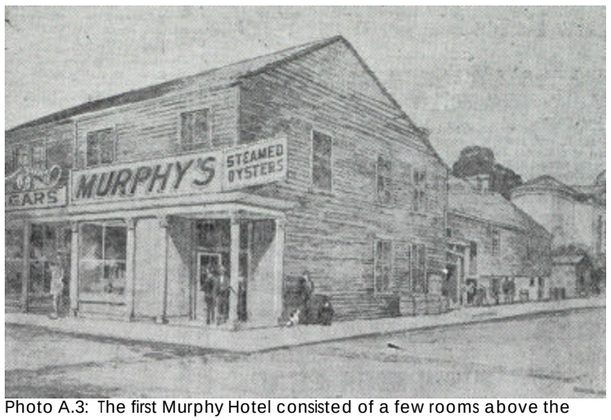

Photo A.3: The first Murphy Hotel consisted of a few rooms above the oyster bar.

-A democratic governor described the charisma of the Murphy and Richmond Hotels, stating "I thought they were equal parts of the Capitol." [10]

- Murphy's Hotel built back-to-back with St. Peter's Catholic Church [1834], a landmark of Classical Revival arch inspired by the Thomas Jefferson's VA State Capitol. [10]

- Murphy raised money and established R.E. Lee Camp No.1, for United Confederate Veterans, [Provided support and companionship for war veterans, known as the Old Soldiers' home, Murphy was named Col. of the camp]. [2]

- "His [Murphy's] 'personal attention' as host is what enabled his hotel to grow to be the largest in Richmond." [1]

1918 - Murphy died; hotel stays in family; run by son-in-law, Col. James T. Disney. [2]

- Disney runs hotel from 1918 until his death in 1933. [2]

1926 - Murphy's 60th Anniversary. [7]

-Murphy's Hotel has been uniquely sensitive to Richmond's changing needs in accommodation; kept up-to-date with modern conveniences; and always gave local merchants and industries preference over out-of-town vendors. [7]

1932 - A. Gerald Bush becomes manager of Murphy's Hotel. [1]

- Democratic State & City Headquarters and Representative Montague's campaign office are in the Grace St annex of Murphy Hotel. [1]

1939 - Board of Directors of The Richmond Hotels, Inc. controls the Murphy Hotel. [8]

1942 - Bridge over 8th Street is demolished and the steel salvaged for the war effort. [11]

1949 - Its Board of Directors decided "Murphy" Hotel will change to "King Carter" after Robert Carter, a Colonial governor [1726]. [8]

- Hotel Richmond and King Carter [Old Hotel Murphy] are merged into one facility, connected by a covered bridge. [9]

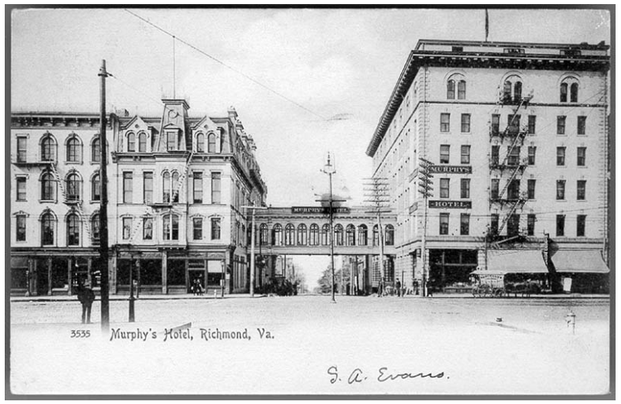

Photo A.4: In 1913, the brick building at the corner of 8th and Broad Streets was demolished and the present building was erected.

Photo A.5: In 1913, John Murphy hired John Kevan Peebles to design the 11-story H-shaped Murphy's Hotel.

- Old Hotel Murphy will be known as "Richmond West" in new combined facilities. [9]

-The combined hotel facilities have "420 transient rooms and 60 "permanent" or apartment-type rooms" [this number is surpassed in VA only by the John Marshall Hotel, which has 500 rooms] Features [of the new combined facilities] include a "permanent guest lounge in the West wing [Murphy's] and a transient guest lounge in the Richmond. They are designed to offer a place for guests to watch television, read, play bridge or write letters."

-The four hotels that make up "Richmond Hotels, Incorporated" are The Hotel Richmond, Richmond West [Murphy's], the Hotel John Marshall, and the Hotel William Byrd.

"Only bridge spanning a city street and used for commercial purposes in the United States" built over Eighth Street to link the two sections of the Murphy's Hotel [6 no date].

-Murphy Hotel was once central to Richmond's and Virginia's political life [Governors, Members of Congress, Federal officials] [6 no date].

- Headquarters for all major conventions that came to town [6 no date].

- At time of article, was still headquarters of the City Democratic Committee [6 no date].

1966 -Murphy Hotel is acquired by the state and initially continues to be leased as a hotel.

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Source 5: Style Weekly, by Edwin Slipek, Jr., 04/17/2002.
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Source 9: "Merging of Two Hotels in Last Phase Here", by Ross Weeks, Jr., Richmond News Leader, no date.
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Source 11: Richmond Times-Dispatch, 08/17/1942.

Photo A.6: Mrs. A. D. Atkinson, the proprietor of the Hotel Richmond, is the "personification of energy, industry and pluck."

HOTEL RICHMOND TIMELINE

1841 -Adeline Detroit Wood born in Bedford.

ca 1861 - Moved to Lynchburg .

1861 - Husband John M. Atkinson served in Company E of the 11th Virginia Infantry during Civil War . [Q]

1866 - After the war, her husband came home and worked as a brick layer, but this income was not sufficient to raise 6 children. Atkinson began to take in paying houseguests, then opened the Warwick House in Lynchburg. [Q]

- A. D. Atkinson worked for the Wall Hotel and managed the Warwick House. [H]

1884 - Came to Richmond, assumed control of the St. James Hotel on Main Street . [H]

1889 - Managed the American, which became the Lexington Hotel for 15 years. [H]

ca 1890 - John Marshall Atkinson dies. [H]

1902 - After being turned down by Richmond bankers for loans to begin her Richmond hotel project, Mrs. Atkinson went to New York City and managed to get a meeting with J. P. Morgan, who was so impressed by her outstanding track record in the hotel industry he backed her loans in Richmond. [Q]

1902 Mrs. Atkinson came up with the idea of building a large, fire-proof hotel at the corner of 9th & Grace Sts, and obtained the lot, known as the St. Claire Hotel lot, which cost $37,000. [B]

1903 - Mrs. Atkinson, owner of the Lexington Hotel, threatens to leave Richmond and the Lexington hotel, and not build "The Richmond" if her unfair tax assessments are not changed. Believes she is being discriminated against because she is a woman. [A]

- "If the Finance Committee shows no disposition to encourage us to build or remain in Richmond, we will go elsewhere, where taxes are not so high." –Mrs. Atkinson, 1903. [B]

- Mrs. A.D. Atkinson temporarily retires from hotel industry, sells the Lexington Hotel to A.G. Spratley and J.L. Rodwell for $20,000. [B]

Photo A.7: In 1904, the 8-story Hotel Richmond was constructed.

Photo A.8: In 1912 a two-story addition with a roof garden was completed.

-Plans to begin immediately on "The Richmond" at the corner of 9th and Grace Sts. [B]

- "Mrs. Atkinson is the personification of energy, industry and pluck. Her business hours are from sunrise to sunrise, whenever necessary." [B]

- Portion of St. Claire Hotel torn down, Richmond Hotel planned to be built on the site at 9th and Grace for $200,000. [C]

- Demolition of part of St. Claire Hotel and other buildings on the site of future "Richmond" hotel executed by Allie Vaughn, an African-American contractor. [C]

- Without warning, half of the Old Virginia House at 9th & Broad collapsed. Building was planned to be demolished in order to clear the lot for the Richmond. [E]

- VA House fell against the east wall of St. Peter's Episcopal residence, tearing a large hole in the wall and cracking it from top to bottom. [E]

- Hotel Richmond promises to be "the most complete and modern hotel in the South." [C]

- Mr. [son] and Mrs. Atkinson finalize plans to build one wing of the hotel only at first, this will provide about 100 rooms. [D]

-Mrs. Atkinson will add to the structure over time, until the plans are completed. [D]

-1903 Large building of St. Claire Hotel will be kept adjacent and incorporated into the new Richmond hotel, this building contains 32 rooms. [F]

1904

- 01/01/1904 First wing of Richmond scheduled to be finished. [F]

- Hotel Richmond built face-to-face with St. Paul's Episcopal [1845] – a landmark of Classical Revival architecture inspired by the construction of Jefferson's VA State Capitol Bldg. [P]

-Hotel Richmond noted for its motifs of Classicism. [P]

- 04/04/1904 - Formal opening to patrons and the public of the eight-story Richmond Hotel. [G]

-Hundreds gather for the opening. [G]

-First wing of Richmond has 180 Guest Chambers. [G]

1911 - Atkinson doubled Richmond's capacity with the $400,000 addition by architect John Kevan Peebles. [Q]

1912 -Completed addition to the Richmond. [H]

-Roof garden set Richmond apart from the Jefferson Hotel. Q

1916 -12/12/1916 – Mrs. Addie Detroit Atkinson dies in her apartment at the Hotel Richmond at the age of 79, leaves 4 children, three grandchildren, and one great-grandchild. [H]

- At the time of Atkinson's death in 1916, the hotel was worth $1 million [estimated $17 million in 2005 dollars]. [Q]

-"Mrs. Atkinson gave such close personal attention to her business affairs that she found it impossible to allow time for other pursuits" "...no attraction ... could induce her to take any time away from her duties as active head of the hotel, and she, therefore, declined all invitations to affiliate herself with any leagues or clubs." [H]

-She held membership only in the Second Presbyterian Church. [H]

- Mrs. Atkinson expressed before her death that she wished for there to be no "signs of mourning at the hotel." [H]

- Regarded as one of the most remarkable women in Richmond. [H]

-One of the first women in Richmond to own a car. Every morning, she drove it to the Farmer's Market to buy food for the hotel. [Q]

-What made Atkinson different from the few other Richmond businesswomen at the time was the size of her business. She was one of 3 or 4 prominent businesswomen in Richmond in the early 1900s. "The kinds of people who stayed with her were running the state of Virginia." [Sandra G. Treadway, deputy director of the Library of VA]. [Q]

-Atkinson raised her twin granddaughters in the Richmond Hotel after their mother died. [Q]

-Started as an employee of a small Lynchburg hotel, and eventually "conceived, built and owned a hotel valued near $1,000,000." [H]

1916 -"She personally gave every detail of the hotel's management her attention, and it was only when her health became impaired, during last summer, that she was forced to relinquish her hold on the affairs of the institution." [I]

-Planned to be buried in Hollywood Cemetery. [I]

1928 - Hotel Richmond has only roof garden in the city, provides a beautiful environment for parties, dancing, entertainment by Eddie Miller and Hotel Richmond Broadcasting Orchestra. [J]

1939 - Board of Directors of The Richmond Hotels, Inc. acquire the Murphy Hotel. [8].

1949 - Richmond Hotels, Inc. Board of Directors decide "Murphy" Hotel will change to "King Carter" after Robert Carter, former governor [1726], [a relative of General Robert E. Lee.] [8]

-Hotel Richmond and King Carter [Old Hotel Murphy] are merged into one facility, connected by a covered bridge. Old Hotel Murphy will be known as "Richmond West" in new combined facilities [9]. The four hotels that make up "Richmond Hotels, Incorporated" are The Hotel Richmond, Richmond West [Murphy's], the Hotel John Marshall, and the Hotel William Byrd.

-The combined hotel facilities have "420 transient rooms and 60 "permanent" or apartment-type rooms" [this number is surpassed in VA only by the John Marshall Hotel, which has 500 rooms] Features [of the new combined facilities] include a "permanent guest lounge in the West wing [Murphy's] and a transient guest lounge in the Richmond. They are designed to offer a place for guests to watch television, read, play bridge or write letters." [9]

1966 - 06/01/1966, State will take over the Hotel Richmond. [M]

-The State Department of Labor and Industry, Department of Military Affairs, State Milk Commission and the administration offices of the Department of Education plan to move into the Hotel Richmond. [M]

- State of VA officially takes possession of Hotel Richmond and its annex, the Richmond West [Murphy's]. [N]

- The Richmond West [Murphy's] will be leased by the state for continued use as a hotel [N]

- 6/01/1966 at noon was the final check-out time for transient guests. [N]

- Organizations with long-term leases will remain until their leases are up. [N]

- Commonwealth of VA paid Richmond Hotels, Inc $1,950,000 for the Hotel Richmond and the Richmond West [Murphy's]. [O]

-1966 State plans to begin renovations immediately to move several government agencies into the Richmond. [O]

-Richmond Hotels, Inc. will continue to operate the Richmond West [Murphy's] as a hotel under lease from the state. [O]

2005 - State had been planning to demolish the building, along with the Murphy, to allow for new office bldgs and a parking deck. [Q]

- Local interest in the fate of the buildings finally caught on with state government, who ordered a feasibility study for the properties. [Q]

Brief History of Virginia Hospitality on the corner of 9th & Grace

1788 -"The corner of Ninth and Grace has been associated with Virginia hospitality for almost 200 years." Starting with The Indian Queen Tavern and then the Washington Tavern in 1788. [K]

1858 - Monumental Tavern [called the Metropolitan Tavern] on that lot. [K]

1860s - Early in Civil War, became Central Tavern, used for Confederate offices. [K]

1870-1900 -The St. Claire Hotel was popular. [K]

1903 - Portion of St. Claire Hotel torn down, Richmond Hotel planned to be built on the site at 9th and Grace for $200,000. [C]

1961 - Centennial Room, the 66-seat dining room at Hotel Richmond which features portraits of Confederate leaders and overlooks Capitol Square and St. Paul's Church, is dedicated in a grand opening, with state and city Civil War Centennial officials attending. Design firm Lippincott & Marguilles Inc. did a full year of research and development preparation for the [Centennial] dining room project. [K]

1966 -"There's one notion about town that the corner [of 9th and Broad] has boasted hotels longer than any other street corner in America. Whatever record the corner may hold, that record ended

quietly at noon yesterday." [O]

-Hotel Richmond open for 63 years, Murphy [King Carter, and then Richmond West] for 55 years. [P]

Political History of Hotel Richmond [& Murphy's]

-For over a half century, the Murphy Hotel and the Hotel Richmond served as Democratic campaign headquarters for state elections, as well as places for gubernatorial and US senatorial candidates to meet and strategize. [L]

-Democrat William M. Tuck [in 1945] and four others [Thomas B. Stanley in 1953, J. Lindsay Almond, Jr. in 57, Albertis S. Harrison in 61, and Mills E. Godwin in 65] ran successful campaigns for Governor from the Hotel Richmond. [L]

-They say no one running from Room 370 has ever lost and election. [L]

-"Among politicking Virginians of three generations, each [Richmond and Murphy's] won widespread affection as a citadel of hospitality and convenience. Both provided refuge, recreation and political campaign command posts for governors, senators and state legislators – plus an infinite variety of other candidates and camp followers – during the glory days of the long dominant, conservative old Democratic organization bossed first by U.S. Sen. Thomas Staples Martin [1895-1920] and then Gov.- Sen. Harry Flood Byrd [1925-1965]." [P]

- Its location overlooking Capitol Square gave the Hotel Richmond an advantage over the Murphy. [P]

-"From a room in the Richmond, by telephone and telegram, he [Tuck] mustered the two-thirds majorities in both houses to make the governor call an extra session [of state legislature]." [P]

-Room 370 in the Richmond was said to have the best view of the Executive Mansion and the Capitol. [P]

-Sen. Harrison arranged to have Rm. 370 as his personal residence during his legislative sessions. He occupied this room until he became attorney general and then governor. [P]

-"Room 370 was retired from politics with an undefeated, untied record. No campaign directed from 370 was a loser." [P]

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Capitol Square –
Eighth and Ninth Street Buildings:
Structural Feasibility Study
at Richmond, Virginia

Progress Draft
31 May 2005

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CAPITOL SQUARE – 8TH AND 9TH STREET BUILDINGS
STRUCTURAL FEASIBILITY STUDY

Robert Silman Associates
31 May 2005
Job No. W1569

A. INTRODUCTION

Robert Silman Associates (RSA) was hired to perform a structural condition assessment of the Eighth Street and Ninth Street Office Buildings in the Capitol Square area of Richmond, Virginia. These historic structures, built in phases between 1904 and 1913, anchor the block between 8th Street, 9th Street, Broad Street and Grace Street in downtown Richmond.

Previous condition assessments have been conducted on the buildings, with conflicting conclusions. The Commonwealth of Virginia, Department of Historic Resources (DHR) and Department of General Services (DGS) wish to determine the feasibility of preservation and best use for the properties.

A variety of treatments are under consideration for the Eighth Street and Ninth Street Office Buildings and the vacant lot between them. The treatments of both buildings may be simplified into the following scenarios:

- Restore the exterior and interior of the existing building
- Restore the exterior of the existing building; retain the building superstructure; gut interior; rebuild interior
- Restore the exterior of the building; demolish the interior of the building; provide demolition procedures and temporary support for the existing exterior during construction; construct a new interior structure
- Demolish the entire existing building; build a new structure on the same site

This report will discuss the existing condition of the structure of both buildings, as well as the structural implications of these four scenarios.

B. EXISTING BUILDINGS – STRUCTURAL ISSUES

This section provides a general description of structural systems, building toward a presentation of floor and roof live load capacities. A discussion of each building's resistance to lateral loads follows.

Eighth Street Office Building

General System Description

The Eighth Street Office Building is a steel frame structure with floor structure consisting of tile and one-way concrete joist slabs. The perimeter steel columns are embedded in the exterior masonry wall. Interior floors are supported on a regular grid of steel columns founded on reinforced concrete spread footings. Refer to Drawings 1 through 3 on page A-1 of Appendix A for typical floor construction.

This building is well documented with original drawings and specifications. RSA has reviewed relevant selections from these documents, including structural drawings and structural specifications, to make a general assessment of the existing structural system.

Live Load Capacities

Original specifications indicate the following structural material properties:

Concrete	1 part cement : 2 parts sand : 4 parts crushed stone Allowable Stress in Concrete = 750 psi Allowable Stress in Steel Reinf. = 18,000 psi
Structural Steel	Ultimate Strength = 60,000 psi to 70,000 psi Elastic Limit, not less than one-half (1/2) the Ultimate Strength Use Fy = 30,000 psi Allowable Stress = 16,000 psi

The following Live Load capacities are itemized within the original specification. RSA has performed selective calculations, looking at both floor slab construction and selected steel floor beams and has found initial results to concur with the loads indicated in the specifications. As such, we present the original live load indications as an acceptable basis for initial planning for the future use of this building.

Room / Floor Type	Allowable Live Load Capacity
Pent House Roof	75 psf
Roofs	60 psf
Attic	50 psf
Bed Room Floors	60 psf
Mezzanine & Main Floors	90 psf
Sidewalk	300 psf
Driveway	600 psf

Of particular interest is the value stated for Bed Room Floors. This is representative of the typical floor construction that would potentially be converted to office use. For office

use, the live load requirement as stated in the International Building Code 2000 is 50 psf, with provision for an additional 20 psf for moveable partitions (70 psf total). Although the existing live load capacity stated above and in the original specifications is only 60 psf (14% less than needed by current code), there are several approaches which may result in achieving the required value:

1. A more refined structural analysis of the existing system may show higher capacities. Preliminary calculations by RSA show the existing floor system, as defined in the original documents, to have a live load capacity of approximately 64 psf (9% less than needed by current code) while analysis of the typical steel framing, indicates live load capacities generally greater than the required 70 psf. Materials testing and exploratory probes would provide a more precise assessment of existing capacity.
2. The original specification indicates that over the structural slab, each floor typically has 3 ½" of finishes and fills. At the Bed Rooms, it states that these materials result in 35 psf of dead load on the slab. The fills consist of cement or cinder fill, with wood sleepers set below areas of wood flooring. This material can potentially be removed and replaced with a lighter finish system in order to recapture the additional live load required.

Lateral Load Resistance

Typical of steel frame buildings of this era, lateral forces such as wind or earthquake were assumed to be adequately resisted by the masonry infill used to construct the exterior and lightcourt exterior walls. If the extent of renovations leads to a requirement to upgrade this building to meet current code, it is reasonable to expect a requirement for some structural modifications.

Ninth Street Office Building

General System Description

The Ninth Street Office Building presents conflicting information with respect to its structural system. In general, the building structure consists of load-bearing masonry walls and isolated steel or concrete beams supporting one-way slab construction above the 4th floor level. The floors below present fewer bearings walls, with steel and concrete beams and girders replacing some walls to support the one-way slab system. Refer to Drawings 4 through 6 on page A-2 of Appendix A for typical floor construction.

The 10-story building was constructed in two main phases of work. The original south portion was built in 1904. In 1911, John Kevan Peebles Architects designed a 9th and 10th floor addition over the original building with a full 10-story addition to the north, which more than doubled the original size of the building. RSA has reviewed the structural drawings from the 1911 work and have found several direct conflicts between what is indicated on the drawings in comparison to what is observed on site.

The most important of these conflicts, with respect to planning for future use of the Ninth Street Office Building, is the apparent difference in floor construction. The 1911 drawings indicate the use of a 7" flat one-way reinforced concrete slab. Though much of the floor construction is currently covered with finishes, we were able to clearly observe areas in the 1911 work where a terra cotta tile and one-way concrete joist system was used in place of the flat slab indicated on the drawings. Such conflicts in floor system were observed at three distinct locations:

1. The construction of the roof above the longspan trusses over the south ballroom (part of the 1911 floor additions over the 1904 building).
2. The 9th Floor infill at the south side of the 1904 building shows steel girder and flat slab on the 1911 drawings, however observation from below presents a clear pattern of tile and joists spanning between filler beams.
3. From within the basement of the 1911 addition, we observed several areas of tile and concrete joist floor construction. These areas are called out as reinforced concrete flat slab on the design drawings.

It is interesting to note that within the original specification by John Kevan Peebles Architects for the Eighth Street Office Building (which was designed to be "delivered to the contractor by June 1, 1912") it states with respect to the floor structure design:

> *"Floors. – Floors are figured to carry the loads stated above* [referencing tabulated dead and live loads]*, with a factor of safety of four, and the sizes, heretofore stated, are to be checked by this contractor before he signs the contract, and, if necessary, exceptions noted with the Architect. The signing of the contract without notice of exceptions, is assumption of complete responsibility." P. 23.*

It is clear that with this statement, there is a mechanism in the construction process for the contractor to review, verify, and modify the structural design of the Architect if required. One hypothesis is that this significant modification to the floor slab system was made during this procurement and preconstruction phase.

Live Load Capacities

Given that there are no structural drawings for the 1904 portion of the building and that the floor system of the 1911 work has apparently been constructed with a different system than that which is indicated on the design drawings, we are not able to make a definitive statement of floor live load capacities until a probe investigation is undertaken. The probe investigation would serve to verify the floor construction as well as the amount of dead load in terms of floor fills and finishes. The study would also serve to evaluate the steel and concrete framing, confirming its correspondence to the design drawings (it is unknown if just the one-way slab system was changed). Non-destructive investigation techniques may also serve to provide general corroboration of probe findings in more sensitive areas.

With respect to the current understanding of live load capacity it is important to address the conclusions of a recent engineering report produced by Haynes Whaley Associates, Structural Engineers, dated October 29, 2004. In this report the live load capacities of the 1904 construction (Area A) and the 1911 construction (Area B) are referenced as being 30 psf and 50 psf respectively. The source of this information is from drawing S-1 dated 3/30/81 by Joseph Ladd & Architects. When reviewing this drawing, it is interesting to note that the live load capacities stated are, in turn, referenced parenthetically below as coming from a source at the Division of Engineering, Commonwealth of Virginia. As we have not been able to trace these values back to an original source document or to a definitive investigation, we are unclear whether or not these were just general guidelines provided at this time, which were subsequently

interpreted as actual capacities, or if these are based upon previously available documentation.

The 2004 engineering report also describes the existing floor system of Area A as tile and one-way joist, while that of Area B being 7" one-way slab. As noted above, we believe, based upon site observations, that the flat slab system was likely substituted with tile and joist similar to that of Area A. The report finds Area B to ultimately have an acceptable live load capacity for new office use, based upon an extrapolation from the stated 50 psf and the transition from Allowable Stress Design to Ultimate Strength Design. Our calculation of existing slab capacity based upon the maximum one-way span, using historic material properties (similar to those referenced in the 2004 report), finds a significantly lower live load capacity. However, the slab investigated does not even meet some basic span to thickness ratios, so we conclude that this may have been part of the justification for the change in floor system. Selected beams on the other do appear to present higher live load capacities, on the order of 60 psf, however these calculations are based upon the given 7" slab and estimates of dead load finishes.

Though, as noted above, a definitive value for live load capacity does not appear to be attainable without a probe investigation, the use of historic design tables for the tile and one-way joist system can shed some light on possible capacities for the apparent as-built system. The Joseph Ladd drawings describe the existing tile and joist floor system as being built from a 6" tile with ribs at 16" on center. Using the historic design table's thinnest top slab (1 ½"), the one-way system is tabulated as being able to support a 99 psf Maximum Safe Load for the longest span of 15 feet. If we assume a similar level of finishes and fills as are documented at the Eighth Street Office Building (weighing 35 psf), we are left with a live load capacity equal to 64 psf. Similar to the discussion for Eighth Street, this value is close to our required value of 70 psf for new office use.

The proposed method for strengthening the tile and one-way joist system, as illustrated in Detail 1 of the 2004 report, is a viable approach, although the means of anchorage shown likely conflicts with the existing single bar reinforcement in the concrete rib. If reinforcement is determined necessary, RSA recommends a similar approach using epoxy-bonded carbon fiber laminates. The advantage of carbon fiber is its high tensile capacity and ease of installation. Although the carbon fiber material is likely more expensive than the required steel, the ease of installation and getting the materials where needed on site may more than compensate for the cost difference. Like the steel reinforcement, the bottom surface carbon fiber would need to be fireproofed.

Lateral Load Resistance

Unlike the Eighth Street Office Building, the perimeter walls of the Ninth Street Office Building are load-bearing masonry, without steel columns or spandrel beams integrated into the assembly. Lateral forces such as wind or earthquake were assumed to be adequately resisted by the perimeter masonry bearing walls in combination with interior bearing walls. If the extent of renovations leads to a requirement to upgrade this building to meet current code, it is reasonable to expect a requirement for some structural modifications.

C. STRUCTURAL SCOPE OF EXTERIOR RESTORATION.

This section will discuss the structural requirements for the exterior facades of the buildings in a restoration project in which the superstructure is retained. Reference should be made to RSA's condition assessment, attached as Appendix B, which serves as the basis for evaluation of existing structural systems, levels of existing deterioration, and the extent of active deterioration mechanisms.

Eighth Street Office Building

The terra cotta units in the roof cornice above the top of the roof slab are experiencing moderate cracking and displacement. The terra cotta units below the roof slab are in adequate condition and do not require any repairs. RSA recommends removing the terra cotta units above the roof slab. The units that are cracked beyond repair should be replaced with a similar or identical material. Terra cotta units that are salvageable shall be disassembled from the cornice, repaired with an epoxy, and rebuilt.

The terra cotta units in the lower cornice at Level 3 are in poor condition. Each modillion is supported by a pair of double angles that backspan into the masonry wall. The double angles are assumed to be attached to vertical dowels. Due to corrosion, oxide product from the supporting steel is splitting the terra cotta modillions. Approximately 10% of the modillions have already fallen from the building, and it appears that at least 70% of the modillions are cracked. This cornice requires selective disassembly. The corrosion must be arrested by exposing and cleaning the steel, and the subsequent application of a rust converter to impede future corrosion. If the corrosion encountered during selective disassembly is severe enough that a significant portion of the cross section has been lost, the steel angles should be replaced by a galvanized steel resistant to corrosion. Similarly to the upper cornice, the terra cotta units shall be repaired with epoxy if salvageable. If salvaging the terra cotta units is not feasible, then new units of an identical or similar material should be used.

The steel lintels in the penthouse and the bulkheads are rusting and causing distress to the surrounding masonry. RSA recommends that the brick masonry around these steel lintels be temporarily removed. The existing steel lintels should be removed and replaced by a galvanized steel resistant to corrosion.

Other miscellaneous steel that was used to support the previously existing steel balconies should similarly be removed from the building façade.

Ninth Street Office Building

The brick parapets on the roof are in poor condition. Cracking and movement is evident in several locations, but is most pronounced on the east elevation. RSA recommends the disassembly of the brick parapet walls and the diagonal steel tie-rods. The parapets should be reconstructed with appropriate control joints to mediate building movement.

Previously existing windows in the west façade were spanned with steel lintels. The windows have since been infilled with brick, but the steel lintels have not been removed. The steel is causing bulges in the surrounding brick. If there is an intention to replace the windows in a future renovation/restoration, RSA recommends partial disassembly of

the masonry, followed by the replacement the steel lintels with a corrosion-resistant assembly. If there is no intention to restore the windows, RSA recommends removing the steel lintels altogether and subsequently refilling the opening with brick masonry.

The concrete-encased steel edge beam on the north elevation is spalling. Loose concrete shall be removed and the steel beam shall be inspected at close range for corrosion or other deterioration. The encased steel shall be cleaned, painted, and the concrete shall be patched.

The terra cotta cladding of the 10th floor long-span built-up girder on the south elevation is cracking. RSA recommends repairing the cracked terra cotta with an epoxy.

D. STRUCTURAL SCOPE OF INTERIOR RENOVATION

Eighth Street Office Building

Load-Bearing System

The Eighth Street Office Building is a steel frame structure with floor structure consisting of tile and one-way concrete joist slabs. The perimeter steel columns are embedded in the exterior masonry wall. Interior floors are supported on a regular grid of steel columns founded on reinforced concrete spread footings.

The column grid typically varies between 12'-7" and 15'-6" spacings. The used of columns as opposed to bearing walls offers additional flexibility of interior use with respect to the Ninth Street Office Building.

Floor Construction

The tile and one-way concrete joist slabs provide a relatively compact system that can be penetrated or resupported for new openings in a variety of ways. Small penetrations can be located between ribs with little structural implication. Generally, if ceiling heights permit, larger openings in the floor slab can be supported on new steel beams set below the slab around the perimeter of the new opening. The new steel would frame into the sides of the main steel beams at the column lines.

Structural Scope for Elevator Modifications

Widening existing elevators or introducing new shafts will require the following structural items:

- New reinforced concrete elevator pit with mat foundation. Care will need to be taken regarding the relative elevations of the new pit foundation to the existing column or wall footings. Depending on the depths of existing foundations and the proximity of the new pit, localized underpinning may be required.
- New steel floor framing would be introduced at each penetrated floor level. When new beams frame into existing at such larger openings, reinforcement of existing members may be required. Consideration should be given to the effectiveness of using the new shaft walls as bearing walls for the penetrated slab. If so, the wall would likely be CMU.
- The elevator shaft could be constructed of CMU or shaft wall (if non-load-bearing), however accommodation will need to be made for elevator rail support at regular intervals along the shaft height.
- If the elevator penetrates the existing roof, a new bulkhead construction will be required.

Structural Reinforcement

Reinforcement of steel beams and columns can be performed in a number of ways, generally through the addition of new steel plate or other sections welded to the existing. A metallurgical analysis should be performed to confirm the weldability requirement of the old steel.

Slabs can be reinforced either by introducing new tensile material such as carbon fiber or steel plate along the underside. Alternately, spans can be shortened by introducing intermediate steel members.

Ninth Street Office Building

Load-Bearing System

The widespread presence of masonry bearing walls on this building presents significant limitations to the interior flexibility of the space. Penetrations through bearing walls can be introduced with new steel or concrete lintels, however the redistribution of uniform loads into concentrated areas should be carefully considered.

Floor Construction

The tile and one-way concrete joist slabs provide a relatively compact system that can be penetrated or resupported for new openings in a variety of ways. Small penetrations can be located between ribs with little structural implication. Generally, if ceiling heights permit, larger openings in the floor slab can be supported on new steel beams set below the slab around the perimeter of the new opening. The new steel would frame into existing bearing walls or other structural members.

Structural Scope for Elevator Modifications

Widening existing elevators or introducing new shafts will require the following structural items:

- New reinforced concrete elevator pit with mat foundation. Care will need to be taken regarding the relative elevations of the new pit foundation to the existing column or wall footings. Depending on the depths of existing foundations and the proximity of the new pit, localized underpinning may be required.
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- The elevator shaft could be constructed of CMU or shaft wall (if non-load-bearing), however accommodation will need to be made for elevator rail support at regular intervals along the shaft height.
- If the elevator penetrates the existing roof, a new bulkhead construction will be required.

Structural Reinforcement

Slabs can be reinforced either by introducing new tensile material such as carbon fiber or steel plate along the underside. Alternately, spans can be shortened by introducing intermediate steel members. However, given the relatively long spans, a system of new steel set below the slab may be overly limiting to floor to ceiling heights.

Lightcourt Infill

The proposed infill of the lightcourt on the east face of the building can be achieved in a variety of ways, however careful consideration will need to made of the total loads being taken along the lines of the existing lightcourt perimeter walls. The proposed concept of removing load-bearing masonry along this perimeter would provide the benefit of removing significant dead load along the lines which will need to be supporting new load

from the infill. Given the history the south portion already having two additional stories, with longspan trusses spanning over the ballroom and bearing on the south lightcourt wall, load evaluations should certainly be carried down to foundation level, with careful structural and geotechnical consideration of potential settlement.

E. STRUCTURAL SCOPE OF NEW CONSTRUCTION

The following summarizes general structural criteria and particular areas of concern structurally for the proposed new construction between the Eighth Street and Ninth Street Office Building.

The following table lists the applicable codes and standards for structural design of the proposed new building, along with general floor and roof live load requirements.

STRUCTURAL DESIGN GUIDELINES

Applicable Codes and standards

The following codes and standards are specified by the local Building Department.

A. 2000 International Building Code (IBC) with 2002 Supplements
B. ASCE 7-98, Minimum Design Loads for Buildings and other Structures
C. Commonwealth of Virginia Construction and Professional Services Manual for Architects / Engineers, dated December 1996.

The following structural design codes will be followed as specified by the governing codes and standards:

D. ACI 318-95, Building Code Requirements for Structural Concrete (ACI) as modified by 2000 IBC.
E. AISC Specification for Structural Steel Buildings – Allowable Design and Plastic Design (AISC – ASD), or AISC Load and Resistance Factor Design for structural steel buildings (AISC – LRFD) and the seismic provisions for Structural Steel Buildings – load and resistance factor design as modified by 2000 IBC.

Structural Loadings

Uniformly Distributed Live Loadings

The following values are specified by the applicable codes and standards or are higher values selected for use on this project.

Occupancy or Use	Live Loadings	
	Uniform (psf)	Concentrated (pounds)
Lobbies / Assembly	100(1)	2000 lbs / 2.5 ft^2
First Floor Corridors	100(1)	2000 lbs / 2.5 ft^2
Stairwells	100	300 lbs / 4 in^2 (tread)
Corridors above First Floor	80(1)	2000 lbs / 2.5 ft^2
Mechanical	150(1) (2)	
Offices	50(1)	2000 lbs / 2.5 ft^2
Roof	20	

Stairwells	100	
Light Storage	125	

(1) SDL 20 psf partitions also applied
(2) Used in absence of actual weight of mechanical equipment

Structural System.

Foundations and Below Grade Construction.
New foundations will be required for additional structures on the project site. Before disrupting soil in the neighboring site to the existing buildings, underpinning of the existing buildings is likely required, given the proximity of new below-grade construction to existing foundations. The underpinning of the existing buildings would likely utilize reinforced concrete with conventional approach-pit underpinning, however alternatives should be considered carefully. If the existing buildings and / or their facades are to be retained, the sensitivity of the exterior masonry to settlement should be carefully reviewed, considering the consequence of generating some cracking in these facades.

There is also a concern about disturbing the foundation of Saint Peter's Church, which is located south of the Eighth Street Office Building and west of the Ninth Street Office building. The church reportedly utilizes wood piles as a foundation system. Although the assumed depth of the wood piles would benefit general stability of the church structure, there may be a problem generated by the possibility of drawing down the watertable either in the short-term or permanently. Previously saturated wood piles exposed to air may begin to decompose.

The new structure is programmed to contain several levels of below-grade parking. The foundation system for the new construction will likely consist of subgrade reinforced concrete walls, slabs, and columns.

The water table in this area may become an issue for subgrade construction as well as with respect to its affect on adjacent buildings. This should be carefully investigated in future design stages.

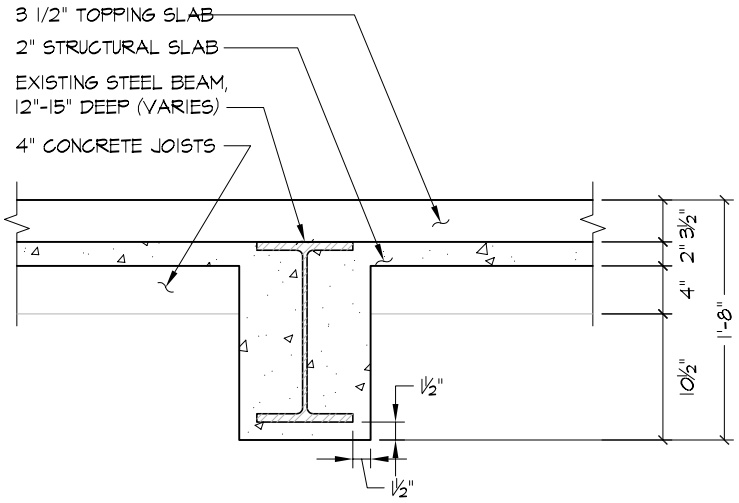
Superstructure.
The superstructure of the new construction will likely be a laterally-braced structural steel frame. Floor slabs would likely be concrete on composite metal deck.

The proposed typical floor-to-floor height of the new structure is 13'-0". In this scenario, the new building will only connect to the structure of the existing buildings at discreet levels.

Façade Retention.
In the scenario where the existing building facades are retained while interior floor, roof and wall construction is demolished, temporary structural systems will be required in order to brace the existing façade during the construction of the proposed new infill building. A sidewalk closure and construction of an exterior full-height bracing frame can allow for freedom to work within the boundaries defined by the existing facades. Temporary connection to the existing façade should minimize damage to historic masonry. Movement limitations should be carefully considered with respect to predicted and recommended tolerances for the historic masonry facades.

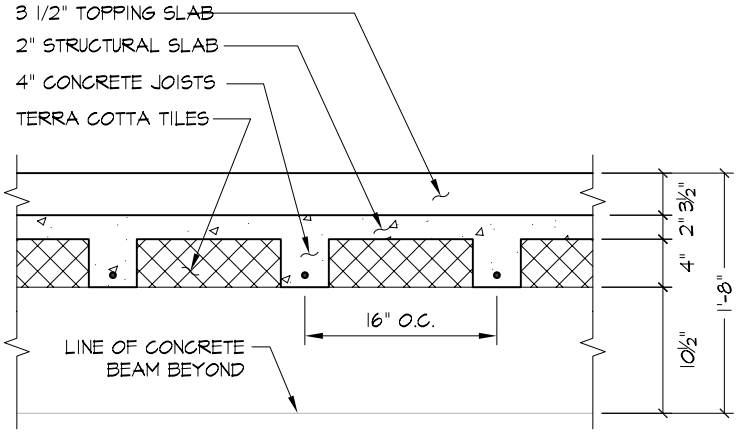
For the scenario where a new atrium is introduced behind the existing facades, a new framework of columns and beams (likely at the original building floor levels) would be required to create a network of steel support behind the historic masonry. It is assumed that the roof above the atrium space would serve to protect the back side of the existing masonry façade. Depending on the desired openness of the atrium space, the stiffness of the façade backup steel should be matched with selected bracing points to the lateral system of the new infill construction. Bracing of the façade to the new construction will required careful consideration of seismic forces given the relatively large mass of masonry potentially offset from the lateral system of the new construction.

APPENDIX A



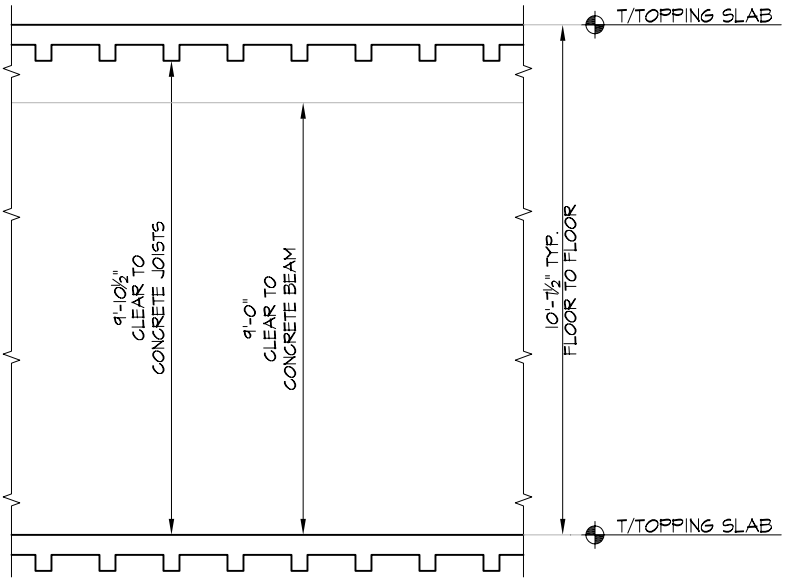
1 / A-1 EOB - TYPICAL BEAM SECTION

SCALE: 3/4"=1'-0"



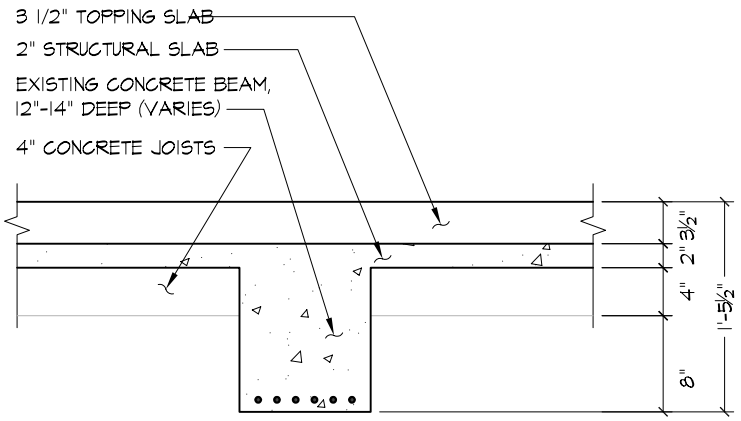
2 / A-1 EOB - TYPICAL JOIST SECTION

SCALE: 3/4"=1'-0"



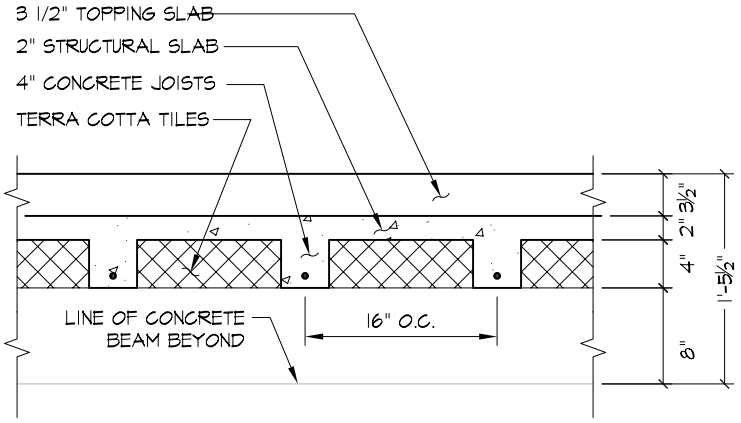
3 / A-1 EOB - TYPICAL CLEARANCE

SCALE: 1/4"=1'-0"



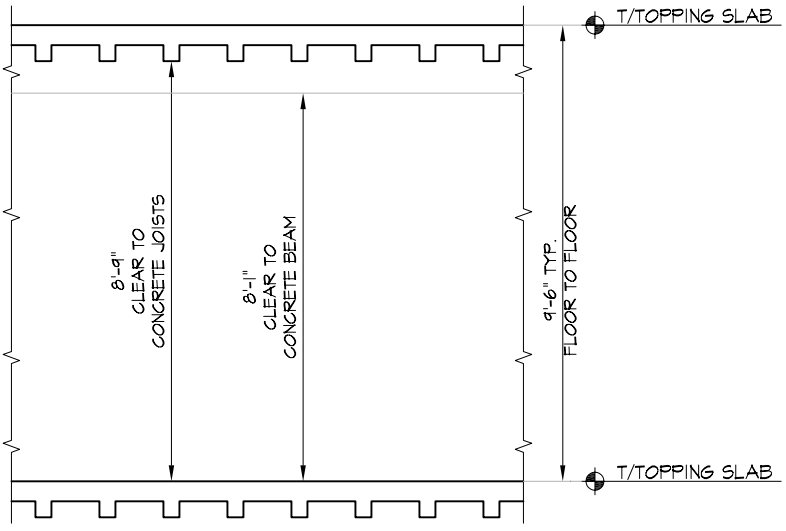
4 / A-2 NOB - TYPICAL BEAM SECTION

SCALE: 3/4"=1'-0"



5 / A-2 NOB - TYPICAL JOIST SECTION

SCALE: 3/4"=1'-0"



6 / A-2 NOB - TYPICAL CLEARANCE

SCALE: 1/4"=1'-0"

APPENDIX B

APPENDIX B

EXISTING CONDITIONS AND RECOMMENDED REPAIRS

Robert Silman Associates (RSA) was hired to perform a structural condition assessment of the Eighth Street and Ninth Street Office Buildings of Richmond, Virginia. These historic structures, built in 1911 and 1904 respectively, anchor the block between 8th Street, 9th Street, Broad Street and Grace Street in downtown Richmond.

Fig. 1. Eighth Str. Office Building

Previous condition assessments have been conducted on the buildings, with conflicting conclusions. The Commonwealth of Virginia, Department of Historic Resources (DHR) and Department of General Services (DGS) wish to determine the feasibility of preservation and best use for the properties.

Eighth Street Office Building (EOB)

The Eighth Street Office Building, originally known as the Murphy Hotel, is composed of a basement, main floor, mezzanine, nine high-rise levels, and an attic. The building was designed by John Kevan Peebles and built in 1911.

RSA conducted a site visit on April 26-27, 2005. All site data, observations, and photographs date to that time period.

Fig. 2. EOB, Basement Slab

Basement/foundation Structure of the EOB

Two types of foundation walls were noted: unreinforced load-bearing masonry walls and reinforced concrete load-bearing walls. In general, based on an overall inspection of the visible portions of the structure, the foundation appears to be in satisfactory condition. No signs of settlement were noted.

Fig. 3. EOB, Basement Beam

The 1st floor framing observed from the basement level appears to be in fairly good condition in the areas directly below the building mass. However, deterioration was preva-

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lent under the north and west sidewalks. In these locations, the concrete encased steel beams were exposed to exterior precipitation due to inadequate drainage and water protection details. As a result, the steel beams are severely corroding. Oxide jacking is causing spalling of the concrete cover off the beams. Similarly, the underside of the reinforced concrete slab is spalling, exposing the reinforcing bars, which are also corroding.

Fig. 4. EOB, Basement Shoring

In order to stabilize the structure in these areas, an extensive wood shoring system of pressure-treated posts and joists has been installed. The wood shoring appears to be adequately strong and is in good condition. There is standing water in this space, so the water entry has not been stopped.

Fig. 5. EOB, Basement Corrosion

<u>Superstructure/framing of the EOB</u>

RSA surveyed the superstructure where accessible. The interior finishes of the building obscured the structural members in the majority of the building. Thus, the following discussion is primarily based on visual inspection of structural elements in the attic and basement. More information will be gained upon gaining access to the structural drawings.

Fig. 6. EOB, Concrete Joists

The exterior wall is a composed of load-bearing masonry with embedded steel or iron columns. The interior building columns appear to be steel or iron I-beams, encased in cast-in-place concrete or terra cotta tiles.

Fig. 7. EOB, Corroded Beam

The floor framing system appears to be constructed with reinforced concrete joists cast compositely in an inset terra cotta formwork. Long span girders appear to be constructed with steel or iron beams encapsulated in cast-in-place concrete.

Although the interior structure, for the most part, is not accessible, there were no obvious signs of structural distress. The corner exterior steel or iron columns, embedded in the exterior wall, are causing cracking in the corner terra cotta units. Possible repair includes exposing, cleaning, and repainting the steel, and then rebuilding the masonry. There was no cracking observed in the bricks in proximity to the

Fig. 8. EOB, Exterior Brick

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steel or iron columns embedded in the linear portions of the exterior walls.

Some of the beams supporting the roof structure exhibit spalling, which is most likely indicative of localized water penetration.

Fig. 9. EOB, Penthouse Lintel

Exterior enclosure of the EOB

The exterior wall is primarily composed of brick, with decorative terra cotta units. An upper cornice at the top of the building and a lower cornice above Level 2 are both composed of terra cotta units. Original metal fire escapes have been removed. Additionally, some of the original balconies have been removed. Steel lintels are present above the masonry openings.

Fig. 10. EOB, Exterior Terra Cotta

The brick generally appears to be in satisfactory condition, although it requires stabilization in a few areas. The decorative terra cotta units in the face are experiencing moderate cracking and will require stabilization.

The steel lintels in the majority of the building are in good condition due to the drip edge present in the brick detail. The steel lintels in the penthouse and bulkheads are rusting and causing distress to the surrounding masonry. These lintels will most likely need to be replaced.

Fig. 11. EOB, Exterior Terra Cotta

On the west façade, the minor steel framing members used to support the removed balconies were cut at the exterior face of the building. These steel remnants are exposed to ambient moisture and precipitation and should be removed from the façade.

The upper cornice appears to be in fair condition. The cornice cantilevers approximately five feet over the exterior face of the brick wall and is supported by steel outriggers at the roof level. The outriggers are encapsulated in cast-in-place concrete. In some locations, the concrete is spalling off of the steel beams and may need to be re-

Fig. 12. EOB, Lower Terra Cotta Cornice

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placed with concrete or another fireproofing material. The terra cotta units that are above the roof level, functioning as a short parapet, are experiencing moderate cracking and displacement. Some units will need to be removed and repaired, or replaced. The lower terra cotta elements appear to be stable and will probably not require any retrofit action.

Fig. 13. EOB, Lower Cornice

The lower cornice is in poor condition. Each modillion is supported by a pair of double angles that backspan into the masonry wall and are likely attached to vertical dowels. The steel has been exposed to conditions favorable to corrosion and oxide jacking is affecting the surrounding terra cotta. Approximately 10% of the modillions have fallen from the lower cornice, and approximately 70% to 100% are cracked. Our recommended treatment is to selectively disassemble the cornice, arrest the corrosion, and replace the terra cotta as necessary. In addition, the steel double-angle outriggers would likely need to be extracted and replaced with a new corrosion-resistant assembly.

Fig. 14. EOB, Upper Cornice

Ninth Street Office Building (NOB)

The Ninth Street Office Building was originally known as the Richmond Hotel and designed by John Kevan Peebles. The south portion of the building was built in 1904, composed of 8 floors, an attic, and a basement. In 1911, the building doubled in size with the addition of the north wing (levels 1-10, basement, and attic), as well as the 9th and 10th floor assembly hall on the south portion.

Fig. 15. EOB, Upper Cornice

RSA has reviewed structural framing plans from the 1911 addition to the Ninth Street Office Building. To date, no original 1904 plans have been found, and therefore the framing of the south half of the building is unknown.

Basement/foundation of the NOB

The substructure is constructed of reinforced concrete spread footings for columns. It is likely, but not confirmed, that the columns are steel. Reinforced concrete bearing walls also use reinforced concrete footers.

Fig. 16. EOB, Upper Cornice

The Ninth Street Office Building is similar to the Eighth Street Office Building in that there are two side aisles below

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grade that are out of the boundaries of the building mass of the upper levels. These areas were also susceptible to water penetration, and as a result, steel beams are suffering from significant corrosion and rust jacking, and the concrete slab is experiencing spalling and the reinforcement (a welded wire mesh) is also corroding. Pressure-treated wood posts and joists have been erected as temporary shoring in these areas.

Fig. 17. EOB, Upper Cornice Outrigger Support

The portion of the basement originally designed as the Boiler Room is designated as a hazardous area due to the presence of asbestos. RSA performed a cursory inspection of this area and did not note any structural issues.

The primary roof drain, which is embedded in the brick exterior wall, leaches water into the wall, and causes significant deterioration of the masonry and mortar in this area.

Fig. 18. Ninth St. Office Building

<u>Superstructure/framing of the NOB</u>

The exterior wall of the NOB is a load bearing wall, which is assumed to be brick through all wythes. According to the structural drawings there are no steel columns embedded in any of the exterior walls. The primary vertical structural members on the interior are load bearing masonry walls. Additionally, there are some structural steel columns which are encased in concrete.

Concrete encased steel beams are present in the building in locations where there are no masonry bearing walls. Short spans, such as door openings in the bearing walls, utilize reinforced concrete beams.

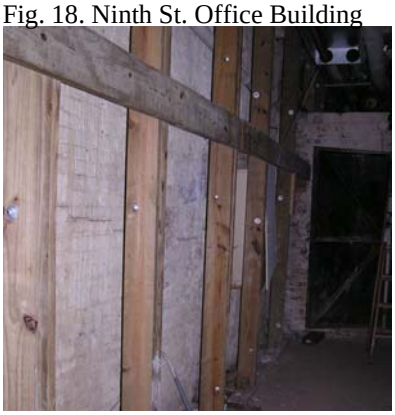

Fig. 19. NOB, Basement Shoring

According to the structural drawings, the floors are supported by one way reinforced concrete slabs. Contrary to this, RSA noted the presence of a terra cotta joist system in the basement and in the attic. Further investigation is necessary to verify which system is typical throughout the building.

Fig. 20. NOB, Basement Deterioration and Shoring

The structural drawings specify two different structural slab conditions. The short span slab, which supports the central corridor, is a 7” slab with 3/8” reinforcing bars at 8” on cen-

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ter. This slab spans approximately 8'-0". The longer span slab, which supports the rooms at either side of the central corridor, is a 7" slab with 5/8" reinforcing bars at 9.5" on center. This slab spans approximately 15'-0".

Another structural design feature of the NOB is the steel truss system that spans over the original ballroom in the south portion of the building. The steel trusses appear to be in good condition.

Fig. 21. NOB, Concrete Joists

Fig. 22. NOB, Steel Trusses

Exterior enclosure of the NOB

The exterior enclosure is primarily brick, with ornamental marble, terra cotta, and other decorative materials. There is a copper cornice approximately 6 feet below the roof level. The south portion of the building features a long-span built-up girder at level 10 that was part of the 1911 addition.

A later renovation, of which RSA has no documentation, extended the roof plane on the north façade to be flush with the exterior wall of the building. A concrete-encased steel beam was erected in this location to support the new roof.

The exterior brick on the upper portion of the north elevation is experiencing efflorescence.

Fig. 23. NOB: North Elevation

The exterior brick on the east elevation is in moderate condition. Portions have been repointed with inappropriate mortar and non-matching bricks.

The exterior brick on the south elevation has been damaged by a previously existing fire escape, and should be removed.

The exterior brick on the west elevation is spalling and some of the mortar joints are opening on the west location. The historic elevations show small windows on the west elevation that have been infilled with brick masonry at a

Fig. 24. NOB: South Elevation

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later date. The original steel lintels for these windows were left in the masonry and are causing bulges in the surrounding brick. In these locations, RSA recommends either removing and replacing the steel lintels with a corrosion-resistant assembly, or removing the steel lintels altogether.

Fig. 25. NOB: East Elevation

The brick parapets of the NOB appear to be in poor condition. Significant cracking and movement is pronounced on the east elevation. Diagonal steel tie rods have been introduced at the northeast and southeast corners of the parapet, apparently to address parapet movement. RSA recommends rebuilding these parapets.

Fig. 26. NOB: West Elevation

The copper cornice of the NOB appears to be in good condition, so it is assumed that no structural remediation is required for this lightweight façade feature.

The edge beam on the north elevation, which appears to be a concrete-encased steel beam, is spalling close to the west support. A structural analysis will be conducted on this member. As a minimum, loose concrete will be removed and any encased steel will be cleaned and painted and the concrete patched.

Fig. 27. NOB: Parapet Tie Rod

The terra cotta cladding of the 10th floor long-span built-up girder on the south elevation is cracking and will require stabilization. The concrete soffit appears to be in satisfactory condition.

Fig. 28. NOB: Edge Beam

Fig. 29. NOB: South Soffit

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TRAFFIC AND PARKING ASSESSMENT

Current Master Plan and Studies

Currently, the Capitol Square area is governed by the 2005 *Virginia State Capitol Master Plan* which documents existing and future employment, office and parking needs. Using the *Master Plan* we will focus on parking and assessment of current policy and needs.

Capitol Square is bounded by Broad Street to the north, Bank Street to the south, Governor Street to the east, and 9th Street to the west. The streets in the Capitol Square area serve both State and Federal office buildings as well as the General Assembly building. The State Capitol grounds attract citizens doing business in the area as well as numerous tourists. Within this relatively small area approximately 60 state agencies conduct business; some of which requires inter-agency involvement. Some of these inter-agency trips are made on foot, generating additional pedestrian traffic, while other trips are made by vehicles which result in additional access and parking impacts.

Chapter Six of the *Master Plan* details design concepts and their correlation to parking. This document references a parking shortfall of approximately 501 parking spaces based on the Virginia Department of General Services [DGS] parking policy of providing a parking space for 80% of all state employees. The *Master Plan* recognizes this unrealistic goal and offers alternative goals based on proposed design options and work schedules to mitigate traffic impact during peak hours. We would recommend DGS eliminate the parking space goal and work with available state owned garages and lots to provide as many spaces as available. Figure 1 illustrates existing buildings and available parking along 8th and 9th Streets.

Existing Traffic Patterns and Conditions

Presently, Broad Street is the only roadway bounding the study area that provides two-directional travel; the remaining streets are all one-way. Broad Street serves vehicles traveling both eastbound and westbound while Grace Street only serves vehicles traveling westbound. 8th Street provides for the southern direction of travel while 9th Street provides for the northern direction of travel.

Northbound 9th Street typically experiences AM, Midday, and PM peak hour delays that quickly subside by the end of the hour. Southbound 8th Street typically experiences increases during the AM, Midday, and PM peak hour; however traffic remains steady as 8th Street is a direct link from Broad Street to Cary Street and beyond. The Greater Richmond Transit Company [GRTC] also has a bus transfer station located at the intersection of 8th and Grace Street which results in additional congestion and delays.

The existing AM and PM peak hour traffic volumes on Broad, Grace, 8th and 9th Streets are illustrated in Figure.2. Analyses of existing conditions indicate that most intersections operate at acceptable levels of service as indicated in Figure.3.

Trip Generation for Proposed Options

Based on the building options provided by Hillier Architecture projected site traffic volumes were generated using ITE Trip Generation Manual 6th Edition. Figure.4 summarizes the 24-hour trip generation for all options and Figure.5 summarizes the detailed trip generation for Option B, which is the worst case scenario of the all the building options. The proposed site traffic for Option B is shown in Figure.6.

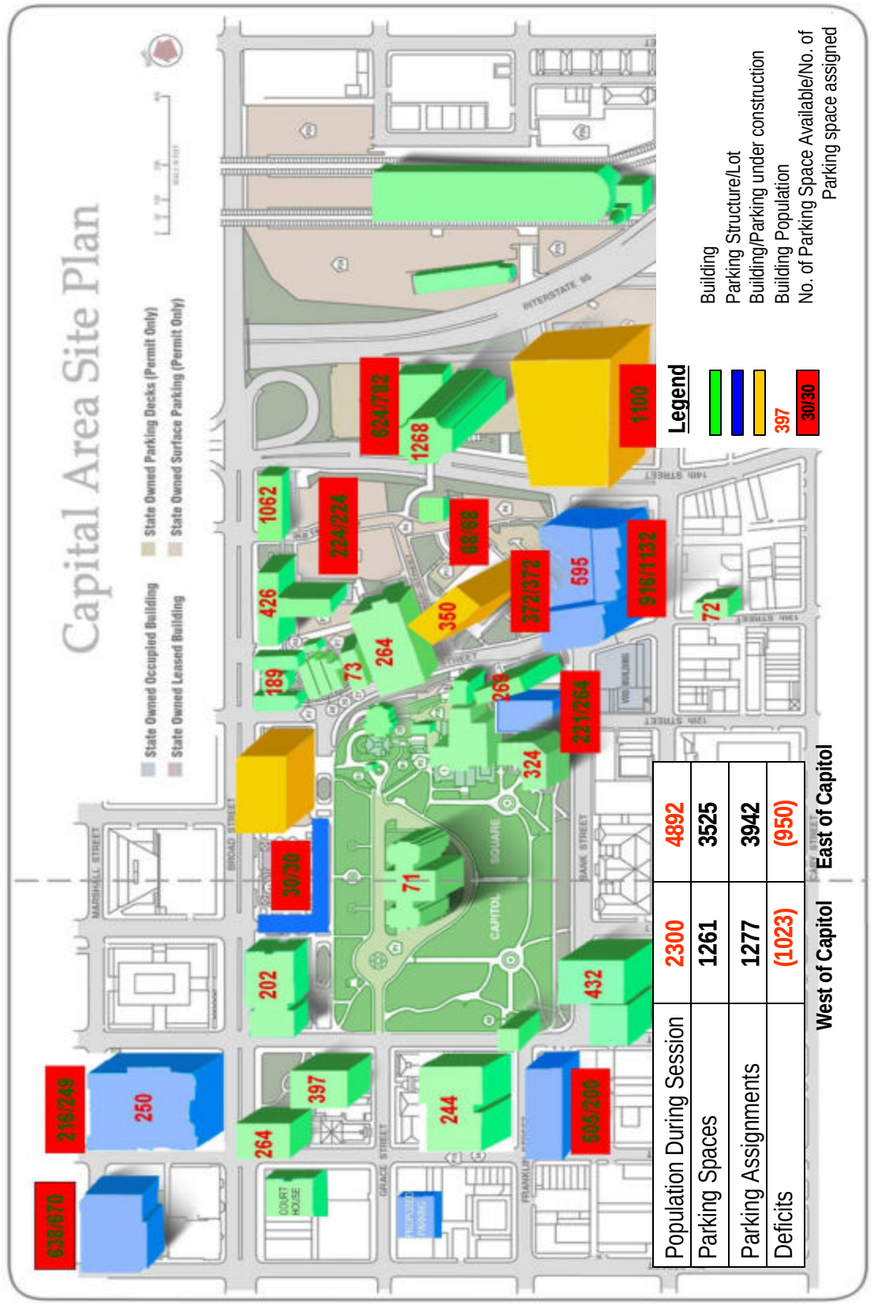


Figure.1: Population and Parking Availability.

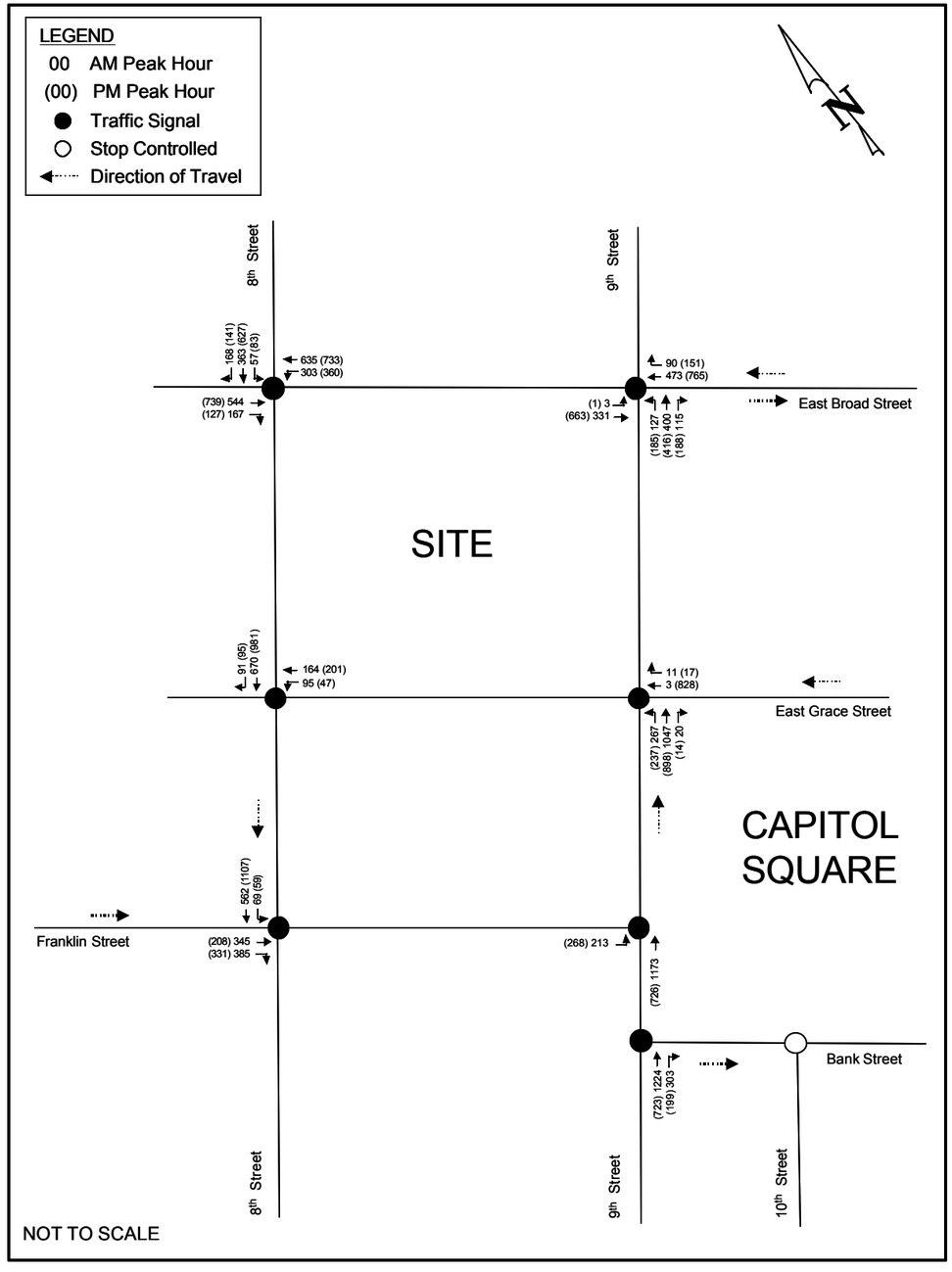


Figure.2: Existing Peak Hour Traffic Volume.

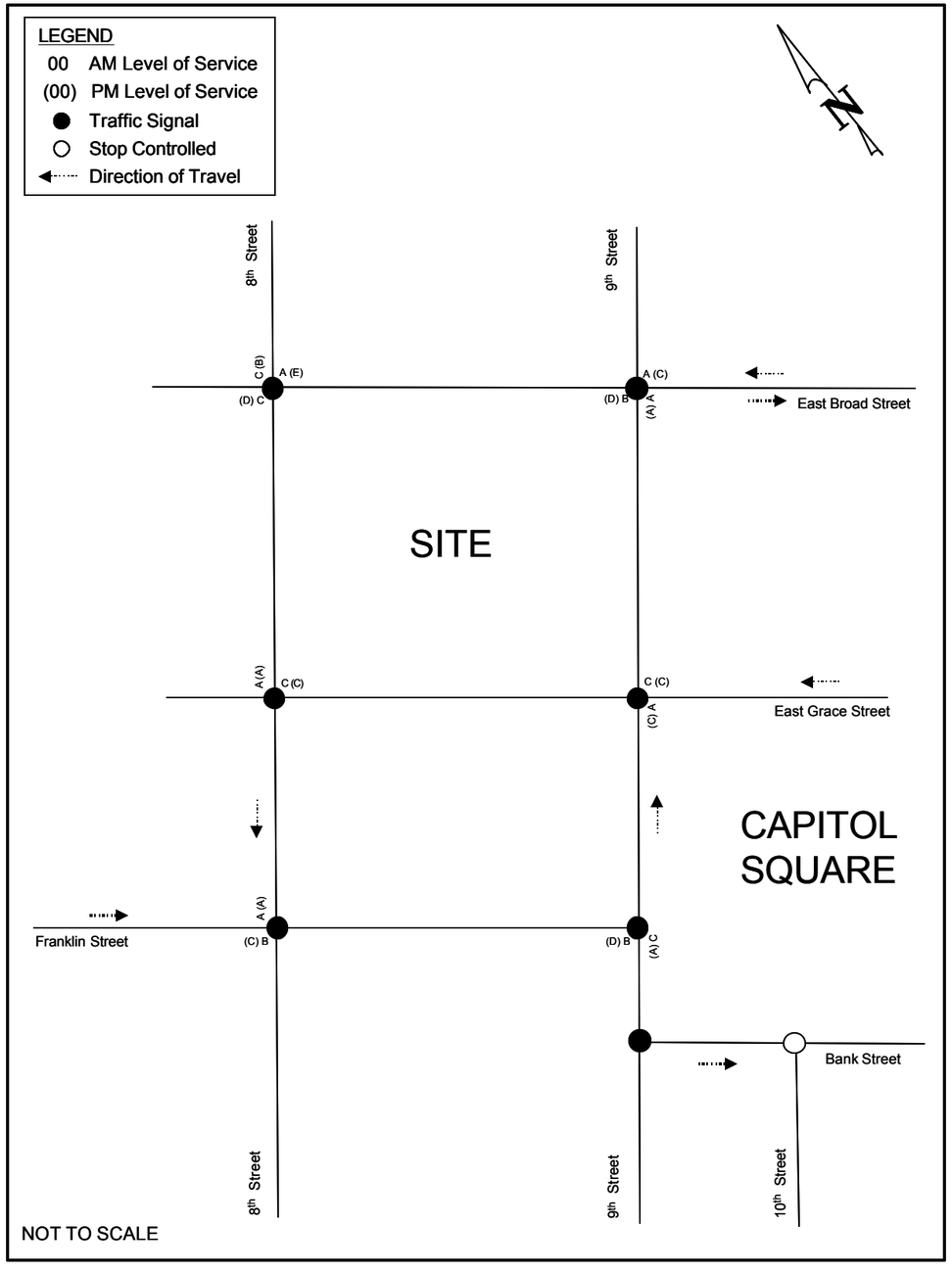


Figure.3: Existing Peak Hour Traffic Volume Levels of Service.

Gross Square Footage Floor	8th	9th	New Construction A	A1 Hotel	A1 Apt	B	B1 Hotel	B1 Apt	C	C1 Hotel	C1 Apt	D	D1	D2	D3
P3			24,000	24,000	24,000	37,000	35,000	35,000	44,000	44,000	44,000	57,000	57,000	57,000	57,000
P2			24,000	24,000	24,000	37,000	35,000	35,000	44,000	44,000	44,000	57,000	57,000	57,000	57,000
C/P1	15,200	21,600	24,000	24,000	24,000	37,000	35,000	35,000	44,000	44,000	44,000	57,000	57,000	57,000	57,000
1 (Office)	12,400	17,700	18,000	18,000	18,000	27,000	27,000	27,000	38,000	38,000	38,000	47,000	47,000	47,000	47,000
1 (Retail)			6,000	6,000	6,000	10,000	10,000	10,000	6,000	6,000	6,000	10,000	10,000	10,000	10,000
2	12,400	14,600	24,000	24,000	24,000	39,000	30,000	30,000	44,000	40,000	40,000	57,000	52,000	53,000	48,000
3	9,500	14,000	24,000	21,000	21,000	39,000	30,000	30,000	44,000	36,000	36,000	57,000	52,000	53,000	48,000
4	9,500	14,000	24,000	21,000	21,000	39,000	30,000	30,000	44,000	36,000	36,000	57,000	52,000	53,000	48,000
5	9,500	14,000	24,000	21,000	21,000	39,000	30,000	30,000	44,000	36,000	36,000	57,000	52,000	53,000	48,000
6	9,500	14,000	24,000	21,000	21,000	39,000	30,000	30,000	44,000	36,000	36,000	57,000	52,000	53,000	48,000
7	9,500	14,000	24,000	21,000	21,000	39,000	30,000	30,000	44,000	36,000	36,000	57,000	52,000	53,000	48,000
8	9,500	14,000	24,000	21,000	21,000	39,000	30,000	30,000	44,000	36,000	36,000	57,000	52,000	53,000	48,000
9	9,500	14,600		15,000	15,000	2,450	14,450	14,450	14,800	10,800	10,800	26,300	56,300	50,300	12,300
10	9,500	9,200													
11	9,500														
Total GSF	125,500	161,700	240,000	240,000	240,000	384,450	366,450	366,450	454,800	442,800	442,800	596,300	596,300	596,300	576,300
Total GSF without Cellar	110,300	140,100	168,000	168,000	168,000	273,450	261,450	261,450	322,800	310,800	310,800	425,300	425,300	425,300	405,300

*Includes 6 floors of 2,000sf 9th Street lightcourt infill

Trip Generation	ITE Code	A	A1 Hotel	A1 Apt	B	B1 Hotel	B1 Apt	C	C1 Hotel	C1 Apt	D	D1	D2	D3
Existing General Office	710	2,705	1,730	1,730	1,730	0	0	1,439	0	0	0	0	0	0
New General Office	710	1,934	1,934	1,934	2,701	2,713	2,713	3,242	3,147	3,147	3,993	3,993	3,993	3,844
New Specialty Retail	814	294	294	294	465	465	465	294	294	294	465	465	465	465
Hotel (replaces existing office)	310	0	1,063	0	0	1,332	0	0	1,063	0	0	0	0	0
Apartment (replaces existing office)	220	0	0	571	0	0	691	0	0	571	0	0	0	0
Total Trips per Day		**4,933**	**5,021**	**4,529**	**4,896**	**4,511**	**3,870**	**4,975**	**4,504**	**4,012**	**4,459**	**4,459**	**4,459**	**4,310**

NOTES ON OPTIONS:
A - 8th & 9th Street offices remain
A1 Hotel - 160 room hotel replaces 8th Street offices; 9th Street offices remain
A1 Apt - 70 apartment units replace 8th Street offices; 9th Street offices remain
B - 8th Street offices are replaced and 9th Street offices remain
B1 Hotel - 190 room hotel replaces 9th Street offices; 8th Street offices remain
B1 Apt - 90 apartment units replace 9th Street offices; 8th Street offices remain
C - 8th Street offices remain and 9th Street offes are replaced
C1 Hotel - 160 room hotel replaces 8th Street offices; 9th Street offices remain
C1 Apt - 70 apartment units replace 8th Street offices; 9th Street offices remain
D, D1, D2, D3 - new office and retail replace 8th & 9th Street offices

Figure .4: 24-Hour Trip Generation for All Options

LAND USE	CODE	AMOUNT	UNITS	ADT	WEEKDAY AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL
9th Street Office	710	140,100	SF	1,730	216	29	246	40	196	236
New Office	710	250,000	SF	2,701	344	47	390	61	298	359
New Special Retail	814	10,000	SF	465	0	0	0	20	26	45
			TOTAL	**4,896**	**560**	**76**	**636**	**121**	**519**	**640**

SOURCE: "Trip Generation Handbook, 6th ed;" Institute of Transportation Engineers

Figure.5: Trip Generation for Option B.

Proposed Traffic Patterns and Conditions

The proposed site traffic for Option B, [the preferred option] was added to the existing volumes to generate the total traffic volumes shown in Figure.7. The total traffic volumes were analyzed using the existing signal timings. As indicated in Figure.8, most of the intersections continue to operate at acceptable levels of service. Since the intersections work for the worst case [Option B] they will also work for the remaining options.

Multimodal Transportation Studies

The City of Richmond has completed two phases of the Fixed Wheel Trolley Study which has identified several east/west and north/south routes providing intercity connectivity. Several of the routes identified in the study show 9th Street as a north / south route. At this time the City is reviewing the second phase results; however, it does not anticipate that funding will be available in the near future.

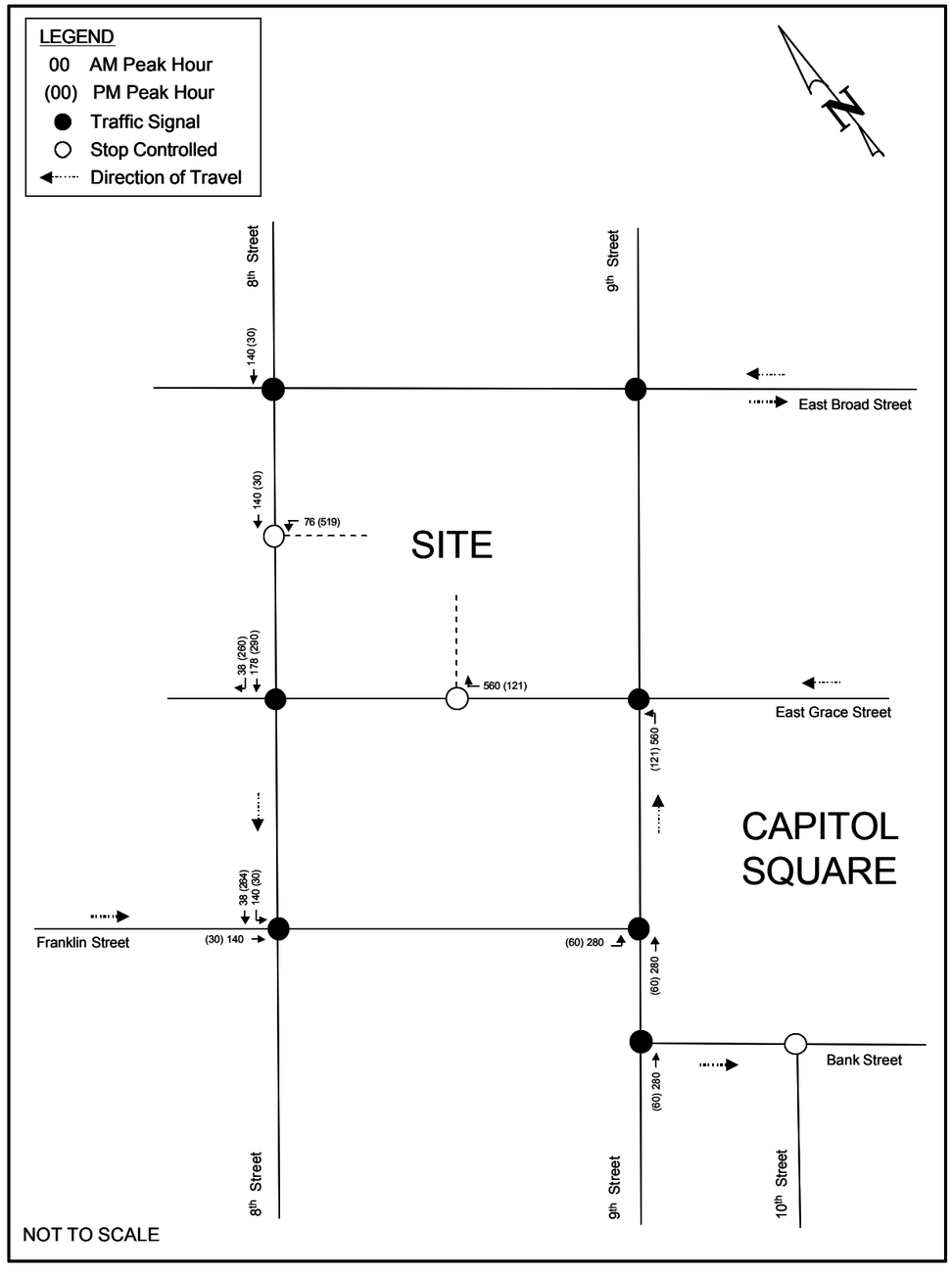


Figure.6: Option B Peak Hour Site Traffic Volumes.

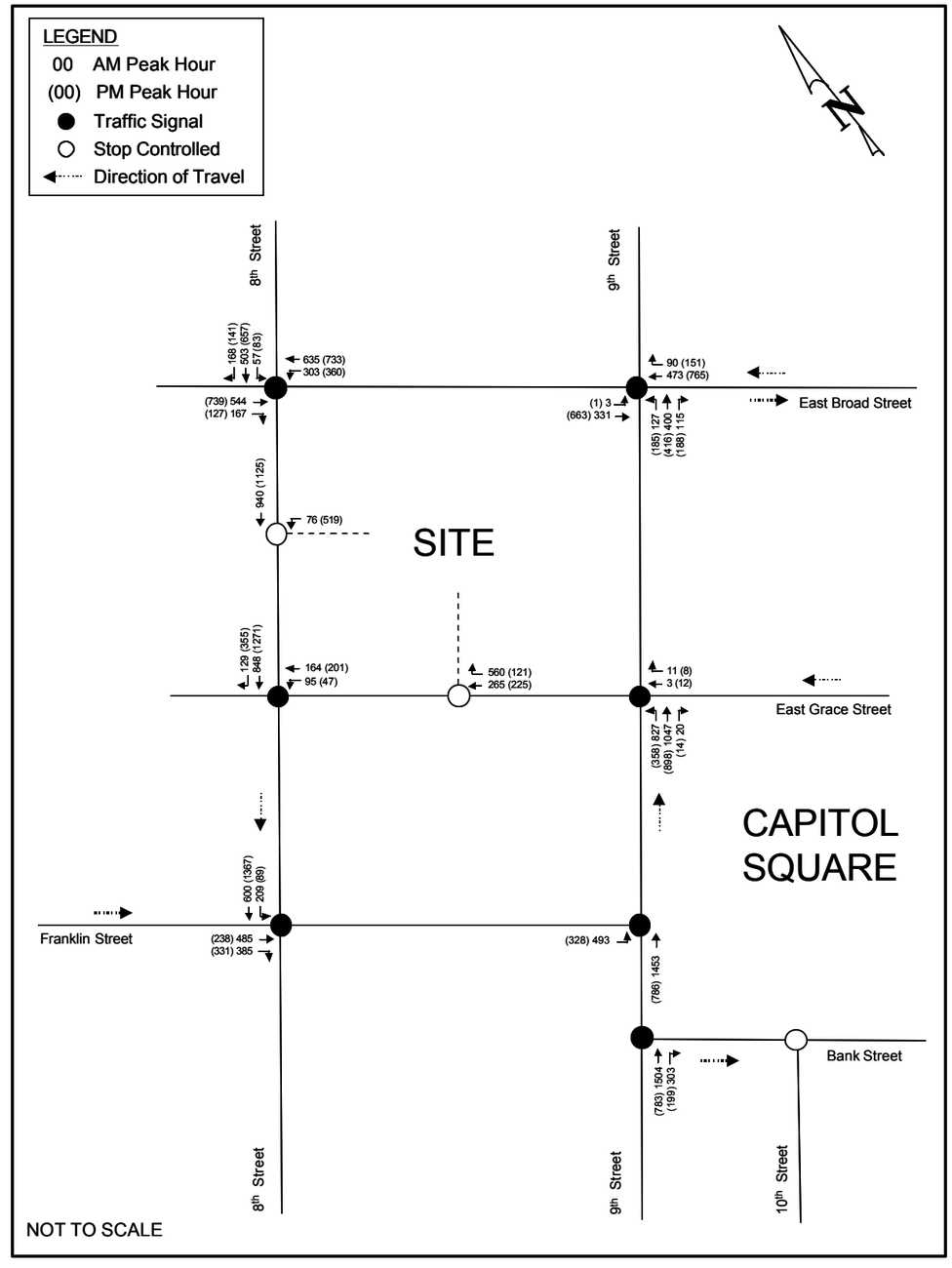


Figure.7: Total Peak Hour Traffic Volumes [Existing Volume Plus Option B Site Traffic].

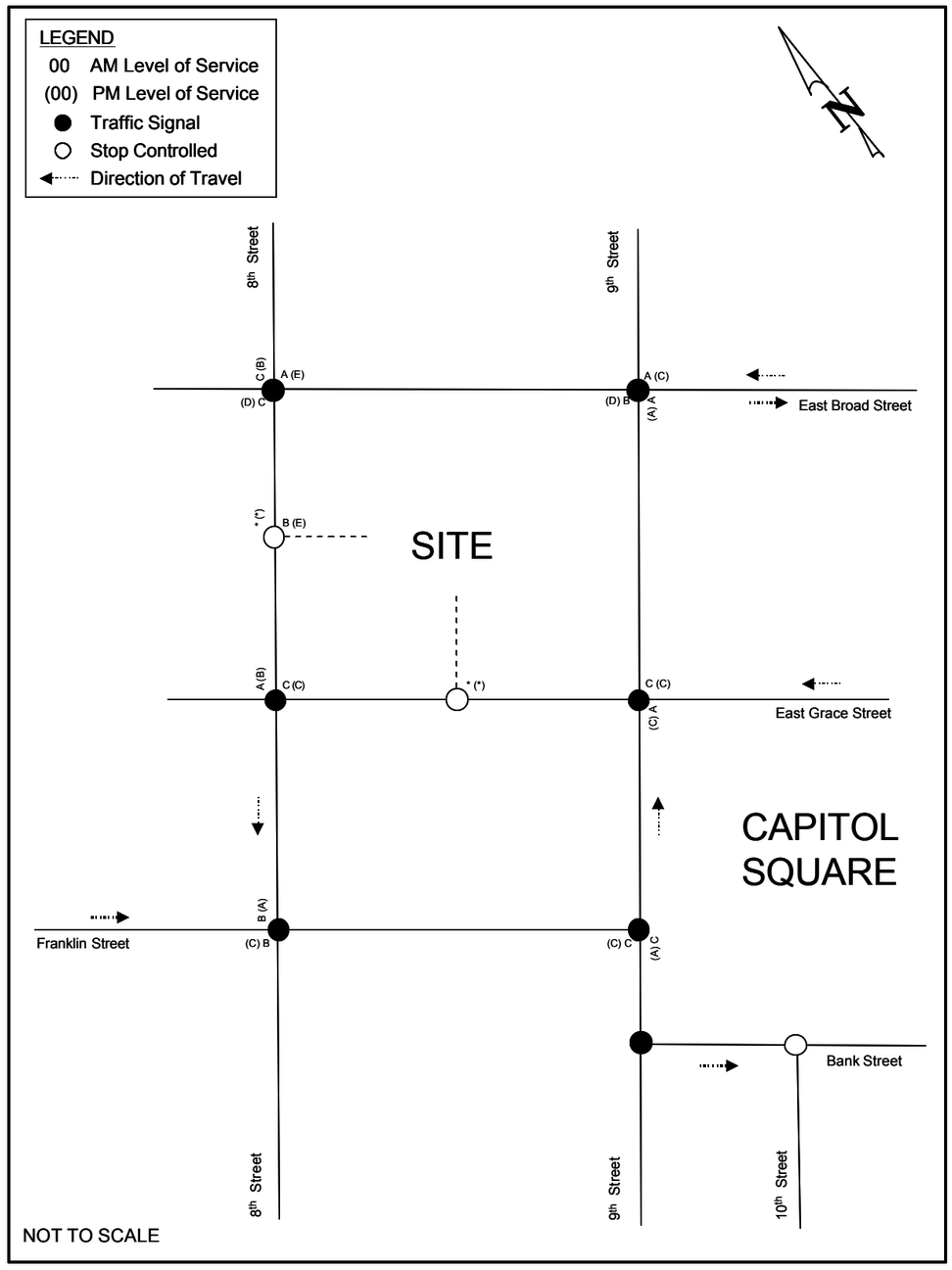


Figure.8: Total Peak Hour Traffic Volume Levels of Service.

Parking Analysis

A review of the existing on-street parking inventory indicated that on-street parking is at a premium and typically was on available on a first come first served basis. The on-street parking primarily serves short term visitors and should not be considered as available parking for General Assembly or occupants of any proposed use at 8th / 9th, Streets and Broad /Grace Streets. Figure.9 illustrates existing on-street parking inventory.

A review of the existing off-street parking inventory indicated two adjacent garages and several parking lot facilities within tolerable walking distances of the proposed site. In addition to the existing facilities, there are plans for a garage to be built on Grace Street at 7th Street. This garage is slated for use by the planned Richmond Performing Arts Center and City of Richmond. Additionally, DGS is completing a 1,100 space garage on 14th Street at Main and Franklin Streets. Figure.10 illustrates existing off-street parking inventory.

An analysis of the existing and proposed facilities for the site indicate that option D has the largest gross square footage [405,300 SF] and based on city zoning regulations will require approximately 1,015 parking spaces. Although the state is not required to satisfy local zoning requirements, this is a good guide for assessing parking needs. These same analyses of the existing 8th and 9th Street office buildings indicate that 277 and 380 parking spaces will be required, respectively. In a review of Options A, A1, B, B1, C and C1, converting the existing 8th and 9th Street buildings to either hotel or apartment uses will require the following parking spaces:

- 8th Street building:
  - 160 room hotel will require 130 spaces
  - 70 apartments will require 70 spaces;
- 9th Street building:
  - 190 room hotel will require 145 spaces
  - 90 apartments will require 90 spaces.

The combinations presented in the options as hotel or apartments would result in the need for 200 spaces for the 8th Street building and 235 spaces for the 9th Street building.

Underlying the required parking needs for any development on 8th or 9th Street are the parking needs for the General Assembly Members and senior staff. The General Assembly parking needs typically last no more than three months out of the year and require flexibility from the facility staff. Providing a 150 space garage on site with entering access from Grace Street and exiting onto 8th Street will provide General Assembly Members with parking across from Capitol Square.

If daily use of this facility is by office employees or hotel visitors or staff, these employees and visitors could be relocated during the General Assembly session and offered valet parking or shuttle service to the office or hotel. As illustrated in Figure.11, the relocation of these daily users could be absorbed by surrounding facilities which would increase the utilization of these outlying parking facilities. While most of the outlying parking facilities are at capacity, several offer reserve capacity that could be used by these relocated daily uses. Additionally, DGS could review the use of existing and proposed facilities and determine which could be used temporarily for General Assembly Members and a shuttle provided for transportation to Capitol Square. Ideal facilities to review would be the new deck currently under construction on 14th Street between Main and Bank Streets, the existing facility on 14th Street at Monroe Tower, or the much rumored new deck on Broad Street at 10th Street.

Figure 9: On-Street Parking Inventory.

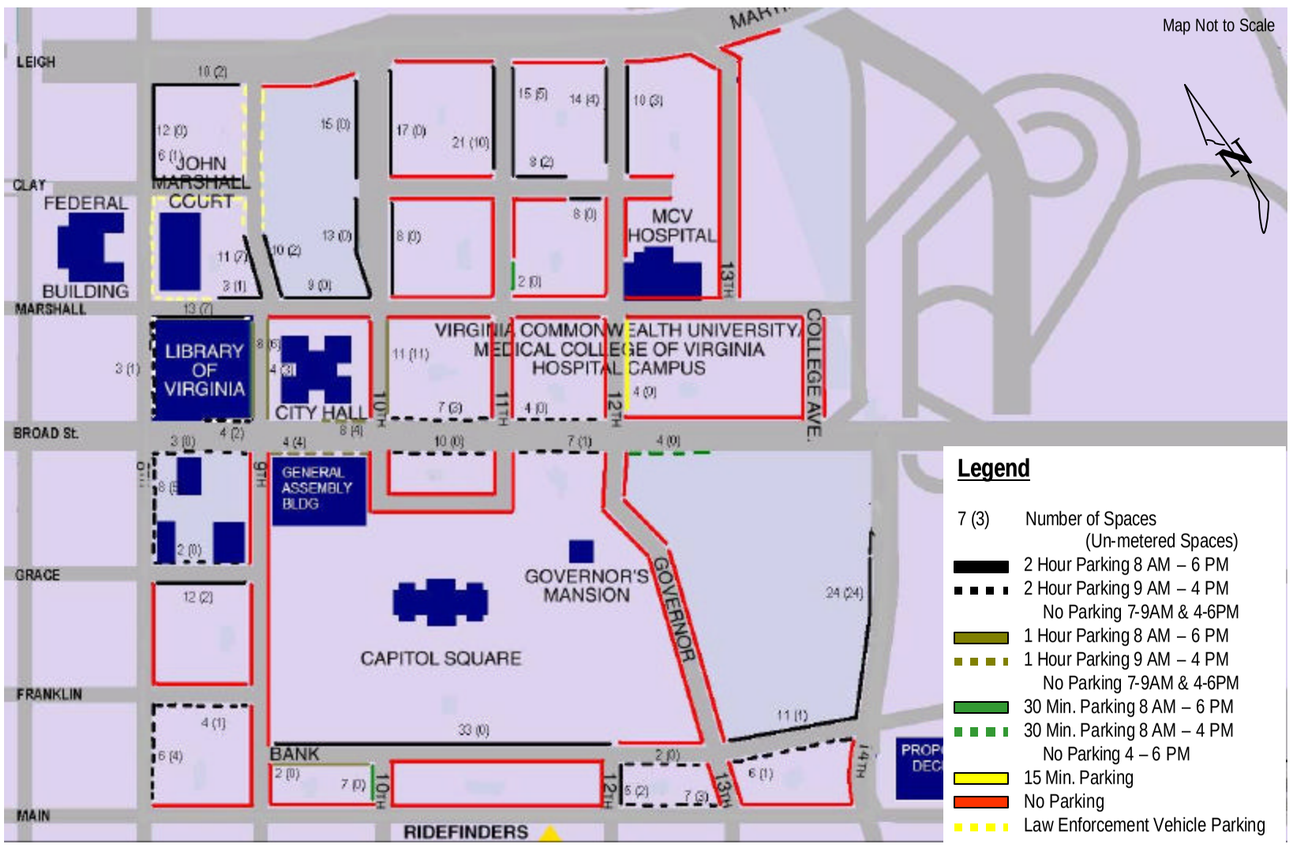


Figure 10: Off-Street Parking Inventory.

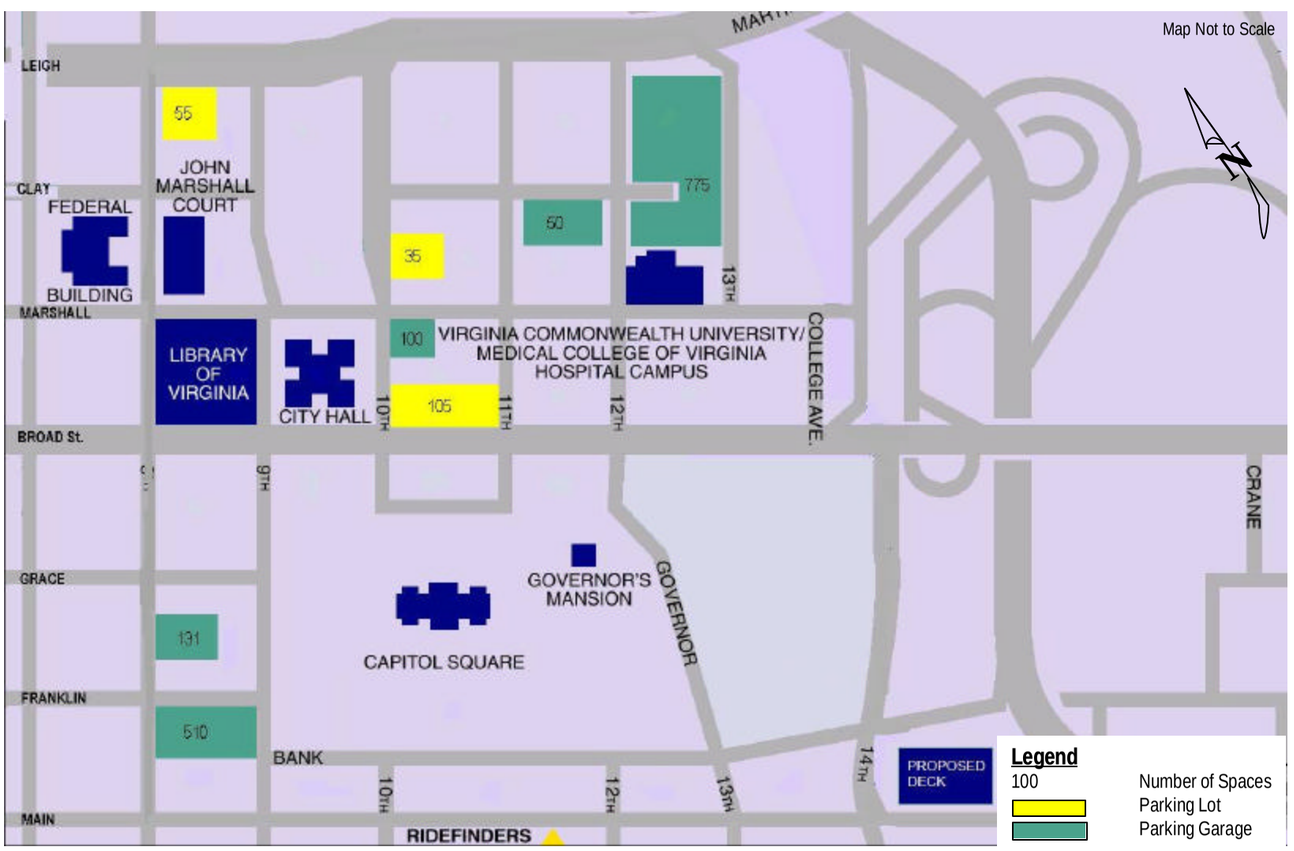
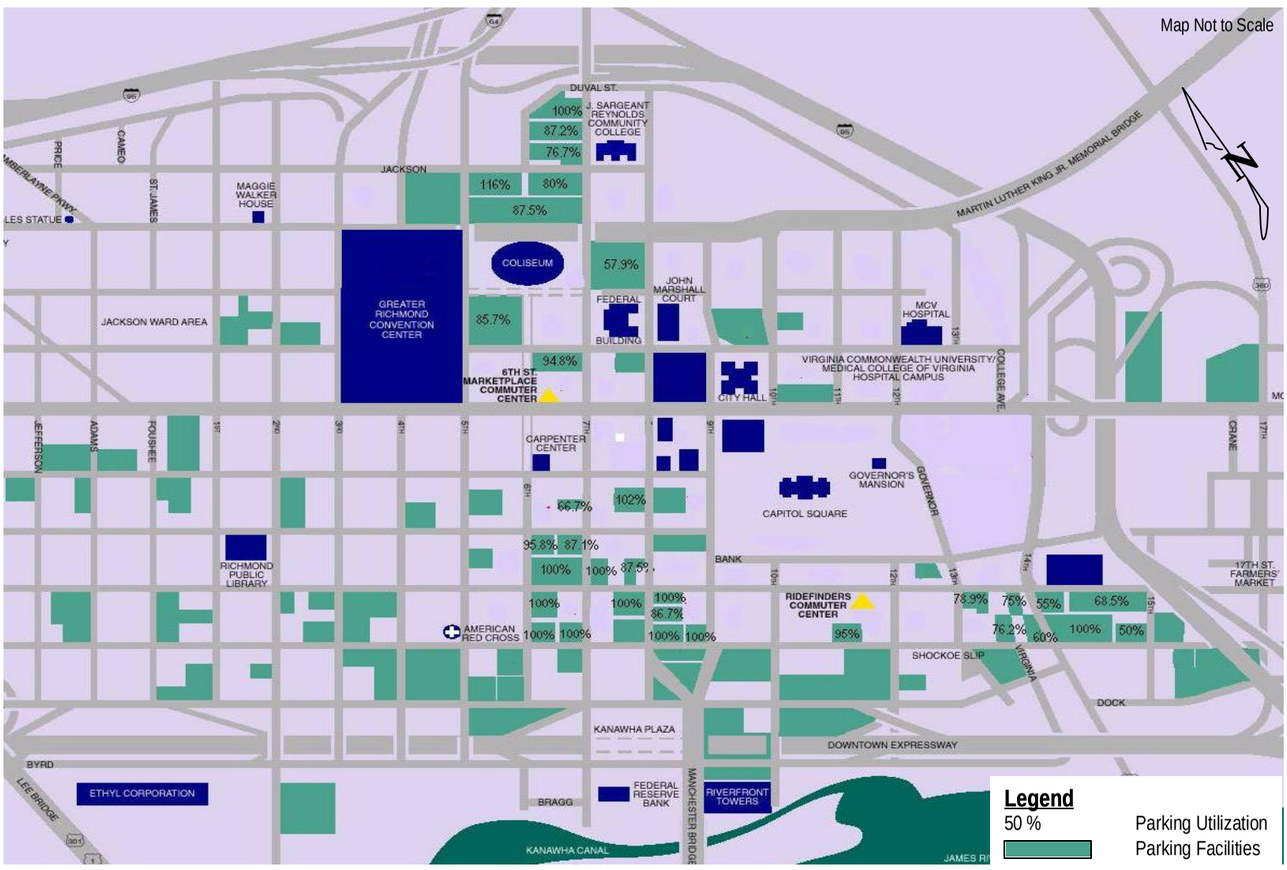


Figure 11: ***Utilization of Outlying Parking Facilities***



ERA
Economics Research Associates

Memorandum of Findings

Date: June 15, 2005

To: George Skarmeas and Scott Duenow, Hillier Architecture

From: Tom Moriarity and Ari Frankel, ERA

Subject: 8th and 9th Street Development Project

Introduction

Economics Research Associates (ERA) was retained to participate in the Hillier Architecture consultant process, focusing on the economic and market potential characteristics of two historic structures and a vacant parcel owned by the Commonwealth of Virginia. The site is bounded by Broad Street, Eighth and Ninth Streets and Grace Streets in the central area of downtown Richmond, Virginia. The analysis is part of an evaluation led by Hillier Architecture and involving other disciplines to consider design, engineering, cost, re-use/preservation and economic/market conditions that might affect redevelopment decisions for the buildings and the overall site. The process included interaction between disciplines; in other words, each of the redevelopment analysis scenarios balanced the realities of the physical capacity and conditions in the historic structures, the stabilization required along the site perimeters, the adaptability of the historic structures to office or other uses, the costs required for appropriate historic renovation, new construction and provision of parking, market trends and timing, and swing space requirements for the Capitol Square Master Plan. The redevelopment analysis was commissioned by the Virginia Department of Historic
Resources (DHR) and the Virginia Department of General Services (DGS).

It is important to note that the agencies which commissioned the study did not ask that the consultants recommend a specific, preferred redevelopment approach for the site. Rather, the Hillier Architecture team was asked to analyze a series of redevelopment options, documenting the advantages and disadvantages of each. Program goals for each of the redevelopment options required that a minimum of 250,000 square feet of office space be created for State offices, that a retail area be included along the Broad Street frontage to the extent possible, and that a minimum of 150 parking spaces be provided in the project. Under the preservation/partial preservation scenarios, the vacant parcel between the historic structures would be used to provide the required density needed beyond the capacity of the existing buildings. Therefore, the allocated density varies, according to the redevelopment scenario.

The redevelopment options considered in the study included:

Option A Preserve both of the historic structures for adaptation into office space for the Commonwealth of Virginia, and construct a new office building on the vacant parcel at Ninth and Broad

Option A1 Preserve the Ninth Street building for office space, construct a new State office building at Ninth and Broad and renovate the Eighth Street building into a hotel or residential project

Option B Preserve the Ninth Street building for offices, demolish the Eighth Street building and construct a new State office building, combining the Ninth and Broad and Eighth and Broad sites into a larger floor plate for office use

Option B1 Preserve the façade of the Eighth Street building, build a new office structure behind the façade and on the Eighth and Broad vacant parcel and preserve the Ninth Street building for a residential or hotel project

Option C Preserve the Eighth Street building as State office space, demolish the Ninth Street building and build a new construction State office building across the full Broad Street side of both parcels

Option C1 Preserve the façade and lobby of the Ninth Street building, demolish the Eighth Street building and construct a new State office building behind the Ninth Street façade and over the vacant Eighth Street parcel, and preserve the Eighth Street building as a residential or hotel re-use

Option D Demolish both buildings and construct a new State office building over all three sites

Option D1 Preserve the façade and lobby of the Eighth Street building, demolish the Ninth Street building and construct a new State office building behind the Eighth Street facade and over the remaining parcels

Option D2 Preserve the façade of the Ninth Street building, demolish the Eighth Street building and construct a new State office building behind the Ninth Street façade and over the two remaining parcels

Option D3 Preserve both historic structure's facades and first floor lobbies and construct a new State office building behind the two facades and on the vacant parcel at Broad and Ninth Streets.

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As described above, in all scenarios the corner of Ninth and Broad Streets would be redeveloped as a state office building with parking constructed below grade. The difference between scenarios for this corner would be the height and floor plate size of the new office structure, as the remaining floor plate area would depend upon the use, as well as the amount of preservation for one or both of the historic structures on the remainder of the site.

In addition to identifying advantages and disadvantages of each scenario, ERA was also asked to consider the market conditions that might allow or restrict redevelopment of one/both of the historic structures as hotel and/or residential uses, as well as assuming a new-construction project for state office space on the vacant corner site. Among the assumptions provided by Hillier Architecture was that the office component would include provision of 160 parking spaces dedicated to the State office building if both existing buildings were preserved, ranging up to 440 spaces if both existing buildings were demolished.

It is also important to note that ERA's analysis takes into account several variables that affect our review of redevelopment options. These variables include a number of factors that affect real estate development decisions, and include the following:

- Comparative projected redevelopment costs for new construction and renovation (please see cost analysis section provided by Hillier Architecture) and comparison of alternative redevelopment budgets
- Project Timing and Phasing, both in respect to available market demand as well as for the changing availability and cost of capital to finance the project
- Requirements for, cost of, and allocation between uses for parking
- Cost of acquisition of the property for commercial development of preserved structures as hotel or residential projects
- Consistency with the required State office program (determined to be a minimum of 250,000 square feet); the potential for non-office uses (such as residential or hotel conversions) vary/are not relevant depending upon the redevelopment scenario
- Market forces affecting value, sales/rental potential, available demand for space and the competitive context in downtown Richmond
- Structural complexity of demolition and new construction (particularly for the landmark Catholic Church building adjacent to the Eighth Street property) and of the structural systems in the two historic buildings
- Existing zoning and zoned requirements (parking, etc.) or needed rezoning
- Other concerns: security issues (with regard to the Federal Courthouse currently under construction across Eighth Street from one of the historic structure); the desire to activate this portion of Broad Street with street-level retail space and a pedestrian-oriented streetscape; urban design concerns about the loss of two well-known historic buildings, proximity to Capitol Square, and the potential for less compatible modern structures in the fabric of the city

In ERA's view, each of these variables should be a factor in determining the most satisfactory approach to redevelopment and provision of the required State office space and supporting uses. As a real estate analysis, preservation of the two buildings appears to be a viable alternative to demolition; however, other factors may also influence the final decision.

As background research on alternatives for site redevelopment, ERA contacted selected local architects, developers, and others familiar with local construction/rehabilitation costs, market trends, pending projects and past experience with renovation and development of housing, office and hotel properties in Richmond. ERA also reviewed the Trammel Crow report on the project site to provide context for the program and development priorities developed in that process. Their views ranged from assessments of local demand and absorption patterns to the specific redevelopment potential of the two historic structures. While some commented that the most immediately pending residential developments are oriented toward waterfront property along the James River, others suggested that one or both of the historic structures have both market and development appeal for redevelopment into housing.

One developer expressed an interest in buying both structures for a fair market value, with the commitment to preserve and redevelop the historic structures as market-rate for-sale and/or rental residential properties. Several also stated that Virginia State Historic Tax Credits would be both required as a powerful incentive to preservation; applicability of Federal Tax Credits was mentioned, but not considered to be as relevant as the Virginia credits. Others questioned whether current housing demand is sufficient to fill both buildings within a near term completion schedule, although lower interest rates and unmet demand for non-conventional housing (loft conversions and apartments and condominiums in historic structures) in downtown Richmond has reportedly created demand that current supply has not fully met. As one developer said, "everything that has been built or renovated has been occupied; there is still unmet demand". Opinions about the condition of the structures for renovation were incomplete, as there has reportedly not been much information made available to the general public about the historic properties from State government (presumably part of the purpose of this redevelopment analysis).

With regard to market-based uses under the preservation scenarios, there was greater interest in residential redevelopment than in conversion of one or both of the structures back to commercial hotels. Several of those interviewed cited the pending Miller & Rhodes building conversion into a hotel property. But the greatest concern was the potential for the Marriott Hotel adjacent to the Convention Center to construct a second rooms tower. Reportedly, the existing hotel (which runs at high average occupancies, but needs more room capacity to fully support the Convention Center) was constructed with foundation piers to add a second tower whenever Marriott decides to expand. From a market standpoint, the second Marriott rooms tower could absorb available room demand, and at a lower cost per room, as the supporting service spaces, conference rooms and other meeting-related amenities are already constructed as part of the existing hotel. This relative ease in capturing potential demand, combined with the lower cost-per-room for supporting amenities and Marriott's known brand and international reservations system will, in ERA's view, make conversion/redevelopment of one/both of the historic structures back into a commercial hotel more difficult to finance and complete in a fashion that can compete with an expanded Marriott hotel product. In June of 2005, U.S. capital markets are

becoming less interested in financing hotels, while the sustained housing market is still considered a stronger investment opportunity.

Based on building design/floor plate alternatives resulting from the concepts described above and on projected cost estimates for renovation, partial preservation and full demolition/ reconstruction provided by other consultants on the Hillier team, ERA developed a model to test each of the scenarios developed by the client, and demonstrates the final cost of each scenario. The cost of providing parking has been included in each final cost calculation, and differs according to the redevelopment scenario. Impacts of the Virginia Historic Tax credit and, where applicable, the Federal Historic Tax Credit, have also been incorporated according to the redevelopment options for which preservation credits would apply.

Program Options Summary

After review of the physical and economic characteristics of the redevelopment options, ERA's analysis suggests the following:

- Preservation of one or both buildings appears to be a reasonable alternative, recognizing that the floor plate efficiencies of the older structures for office use do not meet some state goals for open plan office layouts. Also, the varying floor levels between the potential new State office building site at Ninth and Broad will require specialized elevator stops programs in order to share cores between the new and historic structures
- The estimated price differential between new construction and appropriate renovation differs by about $25 per square foot ($200 per square foot for new construction and $225 per square foot for historically appropriate renovation); this differential would be more than covered by the Historic Tax Credits
- Provision of parking is a greater issue under the renovation options due to the cost and complexity of trying to add new sub-grade parking under existing structures; there may also be security and parking separation requirements for State office and non-State uses (such as a hotel or housing), as it may not be possible to mix the two within the same parking area. It may also be possible to consider remote parking for residential conversion, although that option could affect the potential rental level/sale price
- Demolition of the Eighth Street historic property will add a significant incremental cost for sub-grade shoring in order to protect the landmark Catholic Church on the adjacent site on Grace Street.
- Retail space as an activating use along Broad Street varies in its potential square footage from about 6,500 square feet to 10,000 square feet of street-level space, but can be incorporated into the project
- Housing potential in downtown Richmond has paralleled that in other cities, with successful conversions of historic structures and proposed high-rise new construction housing along the James River. Housing redevelopment in this portion of downtown Richmond has mostly been smaller scale conversions of upper floors of commercial buildings, although there has been expressed developer interest in purchasing one or both of these structures for conversion to housing.
- While it is also physically possible to convert one or both of the buildings back to a hotel use, the potential to finance a hotel conversion will be more constrained due to the Marriott Hotel's pre-existing opportunity to add a second tower of rooms without requiring construction of meeting space and other amenities. There is some indication that downtown Richmond could support another full-service hotel, but the Marriott option will likely be easier to finance, easier to operate and more quickly implemented.
- Based on these findings, ERA suggests that demolition of one or both historic structures should not be considered a foregone conclusion. Availability of incentives, developer interest and market potential all suggest that a blended project can also address the State's office and parking needs without requiring demolition. Variables include the value of the acquisition cost and provision of required incremental parking under current (or revised) zoning mandates for parking.

The residential market in various pockets of Downtown Richmond has gained momentum in the past few years, but it should be noted that the blocks surrounding Capitol Square remain undersupplied with restaurants and nightlife, an amenity that attracts downtown housing. The costs of each of these scenarios are presented later in this memorandum. More detailed comments by use follow.

Downtown Full-Service Hotels

ERA was asked to test the viability of a full-service hotel at either the 8th or 9th street building. The comparable full-service hotels in Downtown Richmond are listed below in **Error! Reference source not found.**. In total, there are nine competitive hotels in Downtown Richmond. ERA obtained data including average occupancy, average daily rate (or ADR), and revenue per room (REVPAR) for these hotels. Despite its historic character, ERA determined that that the Linden Row Inn should not be considered directly comparable because it is too small and does not have a national brand and reservation system. The John Marshall Hotel is a well-known historic hotel that is frequented by business travelers, however recent discussion of a possible conversion to condominiums, and the lack of data availability prevented ERA from including it in the analysis.

Table 1 Downtown Richmond Hotels

Facility	Rooms
Commonwealth Park Suites	59
Crowne Plaza Richmond	299
Omni Richmond Hotel	361
Marriott Richmond	400
Radisson Hotel Historic Richmond	230
Preferred Jefferson Hotel	264
The Berkeley Hotel	56
John Marshall Hotel	60
Linden Row Inn	70
Total Rooms	1,799

Source: Smith Travel Research

Excluding the John Marhsall Hotel and the Linden Row Inn, the following data, obtained through Smith Travel Research, includes the remaining seven full-service hotels and 1,669 rooms in Downtown Richmond. **Error! Reference source not found.** presents a summary of the data analyzed by ERA. The downtown full-service hotel market has been improving since 2002, when the travel industry as a whole experienced a downturn following the attacks of September 11th 2001. In 2004, there was an increase of more than 30,000 roomnights, (representing an increase of 8.3 percent over 2003). In fact, the 2004 figure reached almost 397,000 total roomnights, just under the 404,300 occupied roomnights in 2000.

The increase in roomnights has positioned downtown on the cusp of supporting another full-service hotel. Traditionally, financial markets have considered occupancy rates above 65 percent to indicate sufficient support to introduce additional hotel rooms, and with the recent growth in roomnights, the occupancy rate for the hotels studied is 65.1 percent, up from 60.2 percent one year ago.

While there is an indication of market support for another full-service hotel in Downtown Richmond, there are two other sites that appear to be better located to attract guests, and would likely be cheaper to build and therefore more marketable to financiers.

The Marriott has plans to build a second tower adjacent to its 400-room facility, which already includes the necessary non-revenue driving amenities such as meeting space and restaurants. For years, Marriot has maintained the option to build this second tower, resulting in reluctance by other hotels to assume the risk of entering the market. This tower could be built at a lower cost than that of converting either of the buildings on Eighth or Ninth Streets. The 'Marriott Option' would more easily accommodate additional incremental room demand at a lower cost and higher profitability, as the hotel is already structured to add the additional rooms.

There is also a 216-room Hilton reportedly planned two blocks from Capitol Square, between 5th and 6th on Broad Street in the former Miller & Rhoads Department Store, and adjacent to the performing arts center site currently under development. Current plans call for this facility to be part of a mixed-use building that would also include approximately 200 condominiums and a strong mix of out-of-town restaurants. While the developer has run into some roadblocks securing adequate financing (the Marriot is likely threatening to build its second tower), it also appears to be better situated to meet the demand for another full-service hotel in Downtown Richmond.

The map on the following page shows the hotels included in **Error! Reference source not found.**, as well as Capitol Square and the proposed Hilton site.

Table 2

Annual Performance Indicators
Downtown Richmond Full-Service Hotel Market, 1999-2005 ***(1)***
8th and 9th Street Development Project

	1999	2000	2001	2002	2003	2004	AVG. ANNUAL GROWTH '99-'04
Available Roomnights (Supply)	606,316	609,185	609,185	609,185	609,185	609,185	**0.1%**
Occupied Roomnights (Demand)	377,702	404,300	364,456	356,946	366,505	396,875	**1.0%**
Annual Occupancy (%)	62.3	66.4	59.8	58.6	60.2	65.1	**1.1%**
Average Daily Rate	$ 101.55	$ 104.57	$ 109.34	$ 108.43	$ 109.58	$ 111.00	**1.8%**
Revenue/Available Room	$ 63.26	$ 69.40	$ 65.41	$ 63.54	$ 65.93	$ 72.31	**2.9%**
YEAR-TO-YEAR % GROWTH							
Annual Occupancy	-	6.5%	(9.9%)	(2.1%)	2.7%	8.3%	
Average Daily Rate	-	3.0%	4.6%	(0.8%)	1.1%	1.3%	
Revenue/Available Room	-	9.7%	(5.7%)	(2.9%)	3.8%	9.7%	

FACILITY	ROOMS	%
Radisson Hotel Historic Richmond	230	13.8%
Preferred Jefferson Hotel	264	15.8%
Marriott Richmond	400	24.0%
The Berkeley Hotel	56	3.4%
Commonwealth Park Suites	59	3.5%
Omni Richmond Hotel	361	21.6%
Crowne Plaza Richmond	299	17.9%
TOTAL ROOM INVENTORY:	**1,669**	**100.0%**

(1) Revenue per available room is the best measure of year-to-year growth because it considers simultaneous changes in both room rate and annual occupancy levels.

Source: Smith Travel Research; Economics Research Associates, May, 2005.

Residential Re-Use: Condominiums and Apartments

Like many downtowns nationally, Richmond has experienced a renewed interest in downtown housing. ERA's research indicates that in 2004, almost 1,400 residents moved into the zip codes 23219 and 23220, according to the Experian New Movers Database. These zip codes cover most of the new Downtown housing in Richmond. Maps of these zip codes, as well as the origin of new Downtown residents, are displayed in the appendix. Approximately 70 percent of new residents to Downtown came from either within he City of Richmond, or from Henrico County. The zip codes with the highest frequency of relocation to downtown were 23220 and 23221, which is directly to the West of the 23220 Zip Code.

The most popular developments are about ½ to ¾ of a mile to the South, closer to and along the James River. These projects are located in Shockoe Slip, and Shockoe Bottom, where there are also shops, restaurants, riverboat tours, and nightlife are available.

Riverfront Towers, located at Shockoe Slip, is a mixed-use building with apartments, condominiums, and office space that was fully absorbed in approximately six to eight months. Similarly, the new residential buildings in Shockoe Bottom and Tobacco Row have been successful developments that appeal to students at both VCU (Virginia Commonwealth University) and the medical campuses, as well as young urban professionals and empty nesters that work downtown. Many younger state employees, especially those at jobs with high rates of turnover and who pay rent, are choosing to live down at Tobacco Row.

Overall, the initial conversions of older and historic buildings and of new construction of multi-family housing has been viewed as a success. As a result, a second round of projects are either under construction or planned, however the only one close to Capitol Square is the condominium project that would be part of the old Miller and Rhoads building

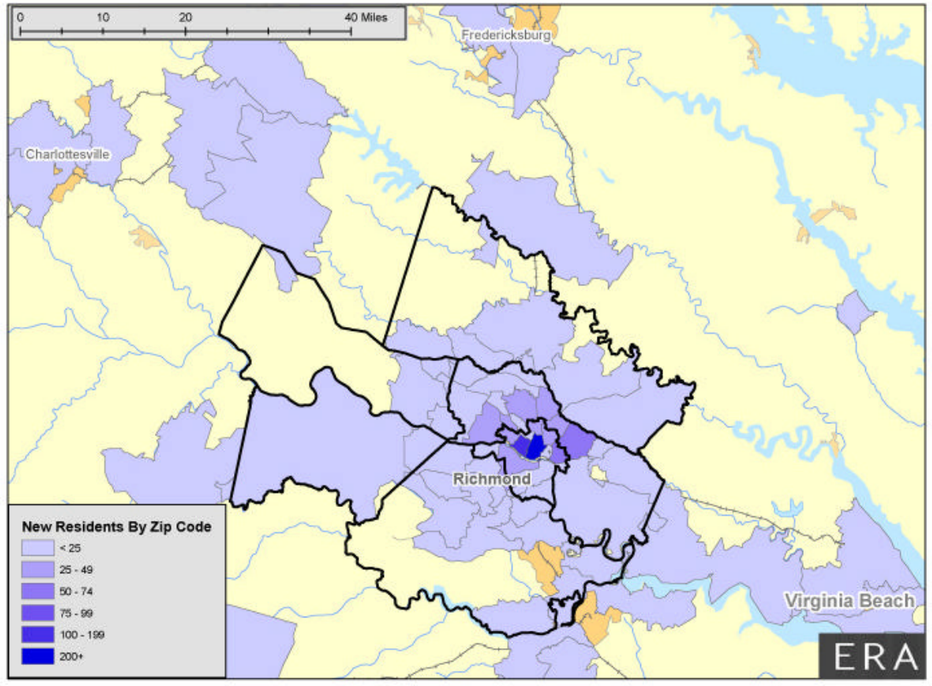
Many of the for-rent buildings received Historic Tax Credits whose time limitations on conversion to condominiums will end over the next few years. As the downtown housing market continues to grow, it is likely that many of these buildings will be converted into for-sale units, resulting in potential demand for additional for-rent units in these neighborhoods. One developer cited the potential for rental and for-sale units to students and faculty of the Virginia Medical School located a few blocks from the site as an underserved market.

Appendix

The appendix which follows includes the supporting tables developed as part of ERA's analysis.

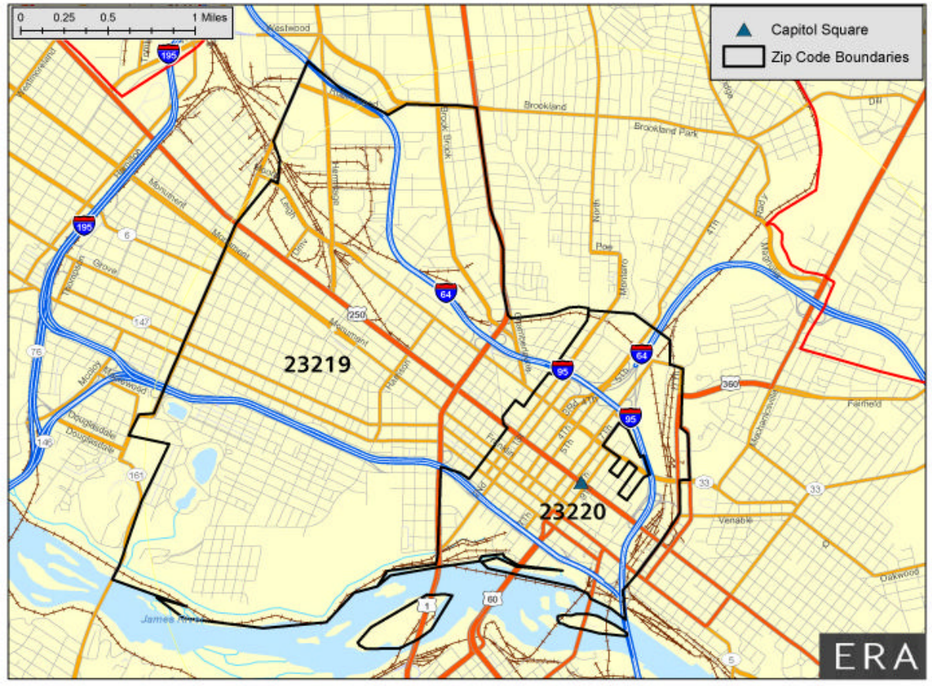
Downtown Richmond Hotels

Downtown Richmond, New Resident Origin By Zip Code, 2004



Source: Experian New Mover Database, To Zip Codes 23219 & 23220

Downtown Richmond: Zip Codes 23219 & 23220



Appendix E: *Construction Cost Estimate Detail*

Based on the recommendations included in Section 6 for the reuse of the existing 8th and 9th Street Buildings and for new construction as outlined in Section 7, the following represents estimated construction costs for the Development Options

These estimates reflect 2006 construction dollars. Detailed scopes of work, based on decisions beyond the scope of this study, would need to be developed in order to refine these estimates. These estimates do not include project soft costs, which can run from 25-30% of construction cost.

Option A Estimated Construction Cost

Description	Quantity	Unit	Unit Cost	Total
8th Street Building Adaptation	**110,300**	**sf**		
- Office Use	125,500	gsf	125	$ 15,687,500
- Exterior Restoration	1	ls	3,700,000	3,700,000
- Window Replacement	1	ls	830,000	830,000
- Structural Retrofits/Repairs	125,500	gsf	5	627,500
- Egress Stairways	2	ea	400,000	800,000
- Roofing	12,400	sf	15	186,000
- Elevators	1	ls	1,155,000	1,155,000
8th Street Subtotal				**$ 22,986,000**
9th Street Building Adaptation	**140,100**	**sf**		
- Office Use	161,700	gsf	120	19,404,000
- Exterior Restoration	1	ls	3,100,000	3,100,000
- Window Replacement	1	ls	1,050,000	1,050,000
- Structural Work	161,700	gsf	5	808,500
- Egress Stairways	3	ea	440,000	1,320,000
- Elevators	1	ls	1,265,000	1,265,000
9th Street Subtotal				**$ 26,947,500**
New Construction	**168,000**	**sf**		
- Office Use	162,000	gsf	195	31,590,000
- Elevators [4 passenger, 1 freight]	47	stops	27,500	1,292,500
- Retail Space	6,000	gsf	100	600,000
- Earth Retaining Systems	1	ls	915,000	915,000
New Construction Subtotal				**$ 34,397,500**
Parking Structure	**72,000**	**sf**		-
- Parking Spaces	160	each	30,000	4,800,000
Site Allowance	1	ls	500,000	500,000
Design and Construction Contingency [15%]				13,444,650
Contractor Overhead and Profit [10%]				10,307,565
Total Option Construction Costs	**490,400**	**sf**		**$ 113,383,215**

Option A1 Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation	**110,300**	**sf**		
- Apartments or Hotel	125,500	gsf	$ 105	$ 13,177,500
- Exterior Restoration	1	ls	3700000	3,700,000
- Window Replacement	1	ls	830000	830,000
- Structural Retrofits/Repairs	125,500	gsf	5	627,500
- Egress Stairways	2	ea	400000	800,000
- Roofing	12,400	sf	15	186,000
- Elevators	1	ls	1155000	1,155,000
8th Street Subtotal				**$ 20,476,000**
9th Street Building Adaptation	**140,100**	**sf**		
- Office Use	161,700	gsf	120	19,404,000
- Exterior Restoration	1	ls	3100000	3,100,000
- Window Replacement	1	ls	1050000	1,050,000
- Structural Work	161,700	gsf	5	808,500
- Egress Stairways	3	ea	440000	1,320,000
- Elevators	1	ls	1265000	1,265,000
9th Street Subtotal				**$ 26,947,500**
New Construction	**168,000**	**sf**		
- Office Use	162,000	gsf	195	31,590,000
- Elevators [4 passenger, 1 freight]	52	stops	27500	1,430,000
- Retail Space	6,000	gsf	100	600,000
- Earth Retaining Systems	1	ls	915000	915,000
New Construction Subtotal				**$ 34,535,000**
Parking Structure	**72,000**	**sf**		-
- Parking Spaces	160	each	30000	4,800,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				13,088,775
Contractor Overhead and Profit [10%]				10,034,728
Total Option Construction Costs	**490,400**	**sf**		**$ 110,382,003**

Option B Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation				
- Demolish Entire Structure	125,500	sf	8	1,004,000
8th Street Subtotal				**$ 1,004,000**
9th Street Building Adaptation	**152,100**	**sf**		
- Office Use	161,700	gsf	120	19,404,000
- Lightcourt Infill	12,000	gsf	210	2,520,000
- Exterior Restoration	1	ls	3100000	3,100,000
- Window Replacement	1	ls	1050000	1,050,000
- Structural Work	161,700	gsf	5	808,500
- Egress Stairways	3	ea	440000	1,320,000
- Elevators	1	ls	1265000	1,265,000
9th Street Subtotal				**$ 29,467,500**
New Construction	**261,450**	**sf**		
- Office Use	251,450	sf	190	47,775,500
- Elevators [7 passenger, 2 freight]	83	stops	25000	2,075,000
- Retail Space	10,000	sf	100	1,000,000
- Earth Retaining Systems	1	ls	1760000	1,760,000
New Construction Subtotal				**$ 52,610,500**
Parking Structure	**111,000**	**sf**		
- Parking Spaces	270	ea	30000	8,100,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				13,752,300
Contractor Overhead and Profit				10,543,430
Total Option Construction Costs	**524,550**	**sf**		**$ 115,977,730**

Option B1 Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation				
- Preserve Existing Fascade	1	ls	1100000	1,100,000
- Demolish Entire Structure	125,500	sf	8	1,004,000
8th Street Subtotal				**$ 2,104,000**
9th Street Building Adaptation	**151,600**	**sf**		
- Apartments or Hotel	161,700	gsf	100	16,170,000
- Exterior Restoration	1	ls	3100000	3,100,000
- Window Replacement	1	ls	1050000	1,050,000
- Structural Work	161,700	gsf	5	808,500
- Egress Stairways	3	ea	440000	1,320,000
- Elevators	1	ls	1265000	1,265,000
9th Street Subtotal				**$ 23,713,500**
New Construction	**261,450**	**sf**		
- Office Use	251,450	sf	190	47,775,500
- Elevators [7 passenger, 2 freight]	92	stops	25000	2,300,000
- Retail Space	5,000	sf	100	500,000
- Atrium Construction	5,000	sf	275	1,375,000
- Earth Retaining Systems	1	ls	1760000	1,760,000
New Construction Subtotal				**$ 53,710,500**
Parking Structure	**111,000**	**sf**		
- Parking Spaces	270	ea	30000	8,100,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				13,219,200
Contractor Overhead and Profit				10,134,720
Total Option Construction Costs	**524,050**	**sf**		**$ 111,481,920**

Option C Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation	**110,300**	**sf**		
- Office Use	125,500	gsf	$ 125	$ 15,687,500
- Exterior Restoration	1	ls	3700000	3,700,000
- Window Replacement	1	ls	830000	830,000
- Structural Retrofits/Repairs	125,500	gsf	5	627,500
- Egress Stairways	2	ea	400000	800,000
- Roofing	12,400	sf	15	186,000
- Elevators	1	ls	1155000	1,155,000
8th Street Subtotal				**$ 22,986,000**
- Demolish Entire Structure	173,200	sf	8	1,385,600
9th Street Subtotal				**$ 1,385,600**
New Construction	**310,800**	**sf**		
- Office Use	304,800	sf	185	56,388,000
- Elevators [7 passenger, 2 freight]	83	stops	25000	2,075,000
- Retail Space	6,000	sf	100	600,000
- Earth Retaining Systems	1	ls	2005000	2,005,000
New Construction Subtotal				**$ 61,068,000**
Parking Structure	**132,000**	**sf**		
- Parking Spaces	320	ea	30000	9,600,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				14,330,940
Contractor Overhead and Profit				10,987,054
Total Option Construction Costs	**553,100**	**sf**		**$ 120,857,594**

Option C1 Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation	**110,300**	**sf**		
- Apartments or Hotel	125,500	gsf	$ 105	$ 13,177,500
- Exterior Restoration	1	ls	3700000	3,700,000
- Window Replacement	1	ls	830000	830,000
- Structural Retrofits/Repairs	125,500	gsf	5	627,500
- Egress Stairways	2	ea	400000	800,000
- Roofing	12,400	sf	15	186,000
- Elevators	1	ls	1155000	1,155,000
8th Street Subtotal				**$ 20,476,000**
9th Street Building Adaptation		**sf**		
- Demolish Entire Structure	173,200	sf	8	1,385,600
- Preserve Existing Fascade	1	ls	740000	740,000
9th Street Subtotal				**$ 2,125,600**
New Construction	**310,800**	**sf**		
- Office Use	300,800	sf	185	55,648,000
- Elevators [7 passenger, 2 freight]	92	stops	25000	2,300,000
- Retail Space	6,000	sf	100	600,000
- Atrium Construction	4,000	sf	275	1,100,000
- Earth Retaining Systems	1	ls	2005000	2,005,000
New Construction Subtotal				**$ 61,653,000**
Parking Structure	**132,000**	**sf**		
- Parking Spaces	320	ea	30000	9,600,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				14,153,190
Contractor Overhead and Profit				10,850,779
Total Option Construction Costs	**553,100**	**sf**		**$ 119,358,569**

Option D Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation				
- Demolish Entire Structure	125,500	sf	8	1,004,000
8th Street Subtotal				**$ 1,004,000**
9th Street Building Adaptation				
- Demolish Entire Structure	173,200	sf	8	1,385,600
9th Street Subtotal				**$ 1,385,600**
New Construction	**405,300**	**sf**		
- Office Use	395,300	sf	180	71,154,000
- Elevators [10 passenger, 2 freight]	111	stops	25000	2,775,000
- Retail Space	10,000	sf	100	1,000,000
- Earth Retaining Systems	1	ls	1782000	1,782,000
New Construction Subtotal				**$ 76,711,000**
Parking Structure	**171,000**	**sf**		
- Parking Spaces	440	ea	27500	12,100,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				13,755,090
Contractor Overhead and Profit				10,545,569
Total Option Construction Costs	**576,300**	**sf**		**$116,001,259**

Option D1 Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation				
- Demolish Entire Structure	125,500	sf	8	1,004,000
- Preserve Existing Fascade	1	ls	1100000	1,100,000
8th Street Subtotal				**$ 2,104,000**
9th Street Building Adaptation				
- Demolish Entire Structure	173,200	sf	8	1,385,600
9th Street Subtotal				**$ 1,385,600**
New Construction	**405,300**	**sf**		
- Office Use	393,300	sf	180	70,794,000
- Elevators [10 passenger, 2 freight]	123	stops	25000	3,075,000
- Retail Space	7,000	sf	100	700,000
- Atrium Construction	5,000	sf	275	1,375,000
- Earth Retaining Systems	1	ls	1782000	1,782,000
New Construction Subtotal				**$ 77,726,000**
Parking Structure	**171,000**	**sf**		
- Parking Spaces	440	ea	27500	12,100,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				14,072,340
Contractor Overhead and Profit				10,788,794
Total Option Construction Costs	**576,300**	**sf**		**$ 118,676,734**

Option D2 Estimated Construction Cost

Description	Quantity	Unit	Unit Cost	Total
8th Street Building Adaptation				
- Demolish Entire Structure	125,500	sf	8	1,004,000
8th Street Subtotal				**$ 1,004,000**
9th Street Building Adaptation				
- Demolish Entire Structure	173,200	sf	8	1,385,600
- Preserve Existing Fascade	1	ls	740000	740,000
9th Street Subtotal				**$ 2,125,600**
New Construction	**405,300**	**sf**		
- Office Use	391,300	sf	180	70,434,000
- Elevators [10 passenger, 2 freight]	111	stops	25000	2,775,000
- Retail Space	10,000	sf	100	1,000,000
- Atrium Construction	4,000	sf	275	1,100,000
- Earth Retaining Systems	1	ls	1782000	1,782,000
New Construction Subtotal				**$ 77,091,000**
Parking Structure	**171,000**	**sf**		
- Parking Spaces	440	ea	27500	12,100,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				13,923,090
Contractor Overhead and Profit				10,674,369
Total Option Construction Costs	**576,300**	**sf**		**$ 117,418,059**

Option D3 Estimated Construction Cost

Description	Quantity	Unit	Unit Costs	Total
8th Street Building Adaptation				
- Demolish Entire Structure	125,500	sf	8	1,004,000
- Preserve Existing Fascade	1	ls	1100000	1,100,000
8th Street Subtotal				**$ 2,104,000**
9th Street Building Adaptation				
- Demolish Entire Structure	173,200	sf	8	1,385,600
- Preserve Existing Fascade	1	ls	740000	740,000
9th Street Subtotal				**$ 2,125,600**
New Construction	**405,300**	**sf**		
- Office Use	389,300	sf	180	70,074,000
- Elevators [10 passenger, 2 freight]	123	stops	25000	3,075,000
- Retail Space	7,000	sf	100	700,000
- Atrium Construction	9,000	sf	275	2,475,000
- Earth Retaining Systems	1	ls	1782000	1,782,000
New Construction Subtotal				**$ 78,106,000**
Parking Structure	**171,000**	**sf**		
- Parking Spaces	440	ea	27500	12,100,000
Site Allowance	1	ls	500000	500,000
Design and Construction Contingency [15%]				14,240,340
Contractor Overhead and Profit				10,917,594
Total Option Construction Costs	**576,300**	**sf**		**$ 120,093,534**

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Refer to Appendix A for additional bibliographies regarding the history of the 8th and 9th Street Buildings.